JOURNAL OF THE
AMERICAN INSTITUTE OF ARCHITECTS

Vol. XII FEBRUARY, 1924 Number 2

A Little Tour In Spain

Photographs by the Author

SPAIN seems like a room long locked, at the far end of a neglected wing in an old house. It is a room filled with strange treasures and the trappings of an historic past. Legends have grown up around these treasures and tales have been told that make the blood tingle and set the imagination on edge. Lands richer in art, such as Italy and France, have suffered by familiarity and their sweetness cloys a little from too much telling. They have been mapped and charted. Streams of tourists have made the beaten paths easy to follow, but Spain, geographically aloof, wrapt about in her ancient dignity and dreaming of her bygone grandeur, has made no sign of self-exploitation as the world marched on. Castles in Spain are less familiar castles and dominate their hills and arid landscapes with all the tremendous and awe-inspiring authority of romance. The sun shines hotly on tawny villages, on glistening white towns, on mosque, cathedral and monastery; on crumbling ruins and proud towers and on mighty masses of masonry which defy the tooth of time.

Spain has had ardent lovers, but for the most part they have been discreet and have not vulgarized her charm. Washington Irving sentimentalized in the Alhambra, as who would not, musing on the loveliness which the caliphs had created. But the divination of Gautier went deeper. His *Voyage en Espagne* is a masterpiece of keen and sympathetic observation and though written more than half a century ago, gives to the reader today the very color of the country and the strong essence of the people. Gautier felt the indomitable granite of Castile and the wild and rugged landscape in the north no less keenly than he responded to the softer blandishments of Andalusia. As an artist his insight penetrated to the racial qualities which underlie the art of any people and his comments have the critical value of interpretations. Richard Ford's book, published in 1840 by Murray as a guide for travelers, is another record of shrewd and canny observation. Ford traveled from end to end of the Peninsula on foot, on mule-back and by diligence and set down his impressions of manners, customs, landscape, architecture, food, festivals and folk-lore, with the candor and precision of a conscientious historian and the animation of an alert gossip. And though times have changed and the railroad and the automobile have succeeded the diligence, the strong flavor of Ford's experiences may be tasted yet. Though the days of brigandage are over and the larger cities like Madrid, Barcelona, and Seville wear a touch of modernity and flourish with a certain cosmopolitan swagger, their background remains mediæval. To turn aside from the not always straight but reasonably narrow path of the railway, still demands a fortitude like Gautier's or Ford's and a zealous curiosity like that which inspired Street a little later to explore and to seek out and analyze the Spanish architecture of the Gothic period. Since then, wandering travelers have sketched in Saragossa, Burgos, Salamanca, and Toledo. Fortuny and Henri Regnault beckoned other painters to follow them to Granada; but the drawings of Prentice, with those of Street, until very recently comprised the major part of the modern architect's library of documents.

Spanish scholarship has been negligent of its heritage and it has remained for two Americans, Arthur Byne and Mildred Stapley, to discover Spain for the Western world. Fifteen years of indefatigable adventure and research by them have produced the books by which the architecture of Spain is known today. The individual and strongly marked characteristics of the Renaissance work of the sixteenth century have been recorded and chronicled by them. They have measured, drawn and photographed the Rejeria of the master smiths and the wooden ceilings of Moorish, Mudejar and Spanish workmanship. They have

described the furniture and domestic arts of a feudal civilization. They have interpreted and analyzed the delights of the hillside gardens of Granada and the subtle charms of the little planted patios which the Moors taught the conquered Spaniard to enjoy. All good Americans who go to Spain, and they are increasing in number, drift inevitably to the hospitable foyer of the Byne's. And those travelers whose footsteps may be guided along the Spanish by-ways by these accomplished docents are fortunate indeed.

Mention should also be made of Miss Georgiana Goddard King, whose articles on Spanish architecture have appeared in the JOURNAL OF THE AMERICAN INSTITUTE OF ARCHITECTS, and whose "The Way of St. James" is a most delightful and scholarly piece of Spanish history; her architectural researches for the Hispanic Society of America offer a valuable contribution to our knowledge and joy of Spain and things Spanish.

BURGOS

Two main highways enter Spain from the north. One passing through Toulouse, Narbonne and Perpignan crosses the border at Port Bou, touches Gerona in the old province of Roussilion, and follows the shores of the Mediterranean to Barcelona. The other strikes southwestwardly from Paris toward Bordeaux and Bayonne and turns the wall of the Pyrenees at Hendaye on the French frontier and Irun on the Spanish. This is the route of the Sud-express which links Paris with Madrid via San Sebastian, Burgos and Valladolid, and it may be called the line of least resistance.

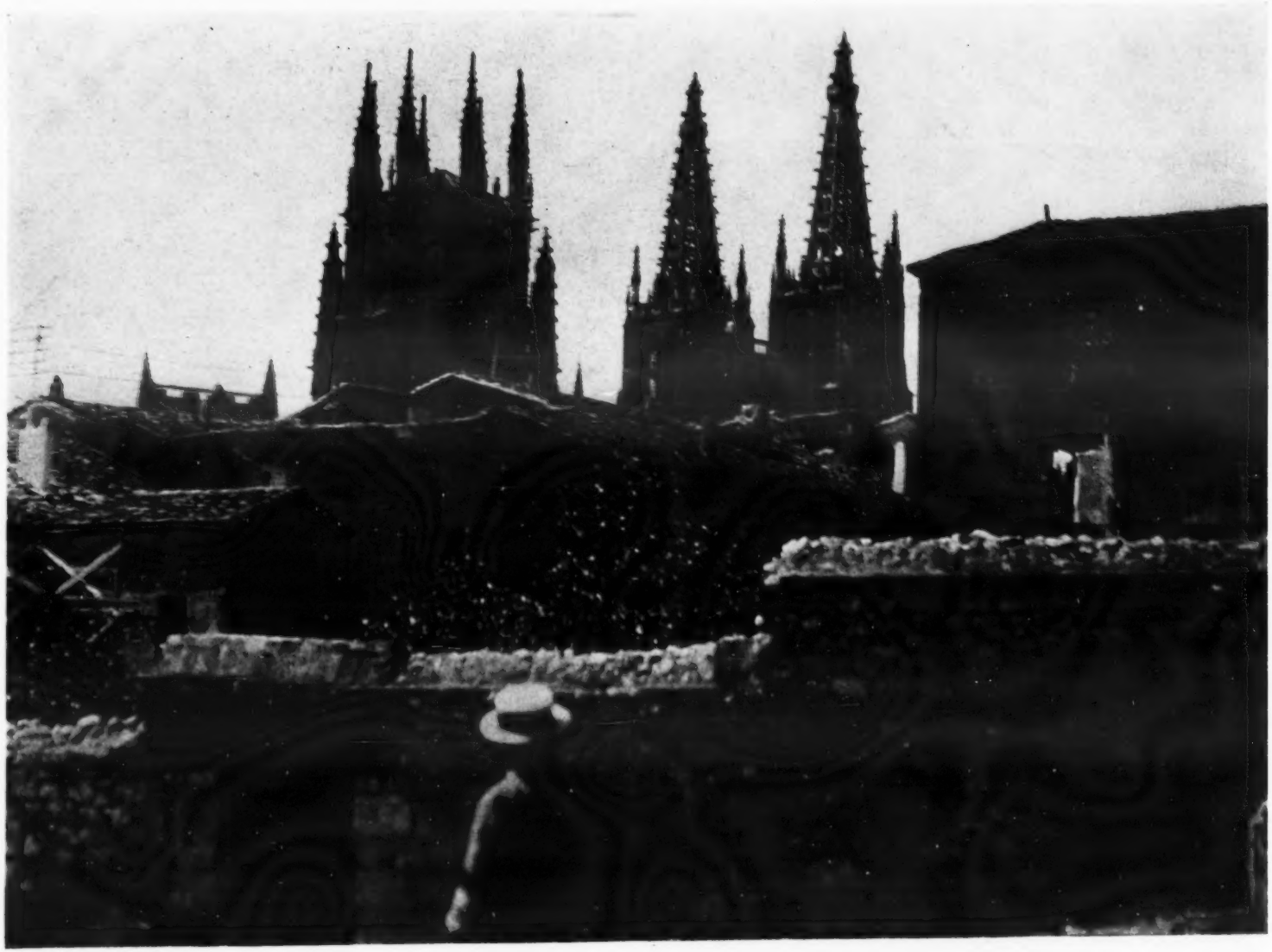
Tile roofs and the long raking pitch of flat gables mark a difference in climate and customs as the valley of the Loire is left behind and the road winds down toward Bayonne. The little round caps (boina) of the Basques dot themselves about the hilly streets of Biarritz and along the Esplanade; and, when the *douane* at Hendaye has been passed, the smiling image of France is suddenly erased. Grave, handsome gentlemen, girls with flashing eyes and black hair, and ladies whom middle age inclines to stoutness make up the summer crowd at San Sebastian. In the casino one recovers a little of France, a little of all the world; but once aboard the *rapide* again, whirling south, there is only Spain. A touch of fierceness in the landscape, features of almost dramatic composition as the road follows the wooded gorges and bores through the dark mountains, make the mild and gentle gardens of Touraine seem far away. At every wayside station the towns-folk, peasants, priests, soldiers and beggars are apparently making holiday. And slowly walking up and down, endlessly as Time is endless, the two Dromios of the Guardia Civil embody the majesty of the law. Their dignified demeanor strives to belie their operatic costume. At first we thought them twins whom some fond mother, loving each in equal measure, had decked out *cap-a-pie* in costumes identical from their tri-cornered patent-leather hats, button for button, down to the soles of their boots. Each was belted and each wore a broad yellow patent-leather sash stretching diagonally from his waist over his shoulder. Each was sallow and grave and somber; and each, as though solemnly resigned to disaster, carried a musket. I am told that the Guardia Civil is a superior body of men, and I can well believe it, for the costume calls for character. We never saw one of them demean himself aught but decorously.

The journey from San Sebastian to Burgos by rail consumes six or seven hours and, as we had left the brisk and fashionable city by the sea at about half-past four, twilight fell before we reached Miranda de Ebro, where we alighted and thronged into the clattering railway restaurant for our first Spanish *comida*. It was very fair, as the guide-book says, and Gargantuan, as Spanish dinners are. When we resumed our journey night had enveloped all the world. The train sped onward, rumbling through tunnels and climbing toward the uplands of Old Castile. We soon left the mountains behind us and peering into the darkness saw only here and there a flickering lamp across the level distance. At each dimly lighted station, however, the crowds walked back and forth and our two friends of the Guardia Civil slowly peregrinated to reassure us.

It is a mistake to approach so fine a city as Burgos, with its dominating Cathedral, by night. Yet the reverberating ride in the hotel omnibus through the stony streets, across the bridge, along the Paseo and under the massive Arco de Santa Maria is not devoid of sensation. Coming from under the archway into the little Plaza del Duque de la Victoria, the Cathedral looms in its great bulk. We rattle past the blank wall of the Claustro—catching a glimpse of heavily barred windows—and draw up with a flourish before the Hotel Norte y Londres. Its interior is ablaze with light and its Art Nouveau decorations, of which Madame is frankly proud, startle us out of our mediæval reveries. Madame has no English but speaks "Français." Very carefully and precisely she speaks it, and we are put away for the night in fleckless quarters. Gautier's time was more romantic, but ours is, after all, more comfortable.

The great pride of Burgos is, of course, the Cathedral, and thither we took our way bright and early in the morning. We walked around it seeking points of view, but it is so a part of its surroundings, so hemmed in and clustered about with fervent and adoring constructions that lean toward it and cling near it that its complete majesty can only be appreciated from a long way off. Its spires strike upward into the sky as though to breathe more freely, and their lace-like perforations seem to invite the sparkling air to enter through and caress them. The higher they go the

BURGOS—THE CATHEDRAL



BURGOS—THE CATHEDRAL

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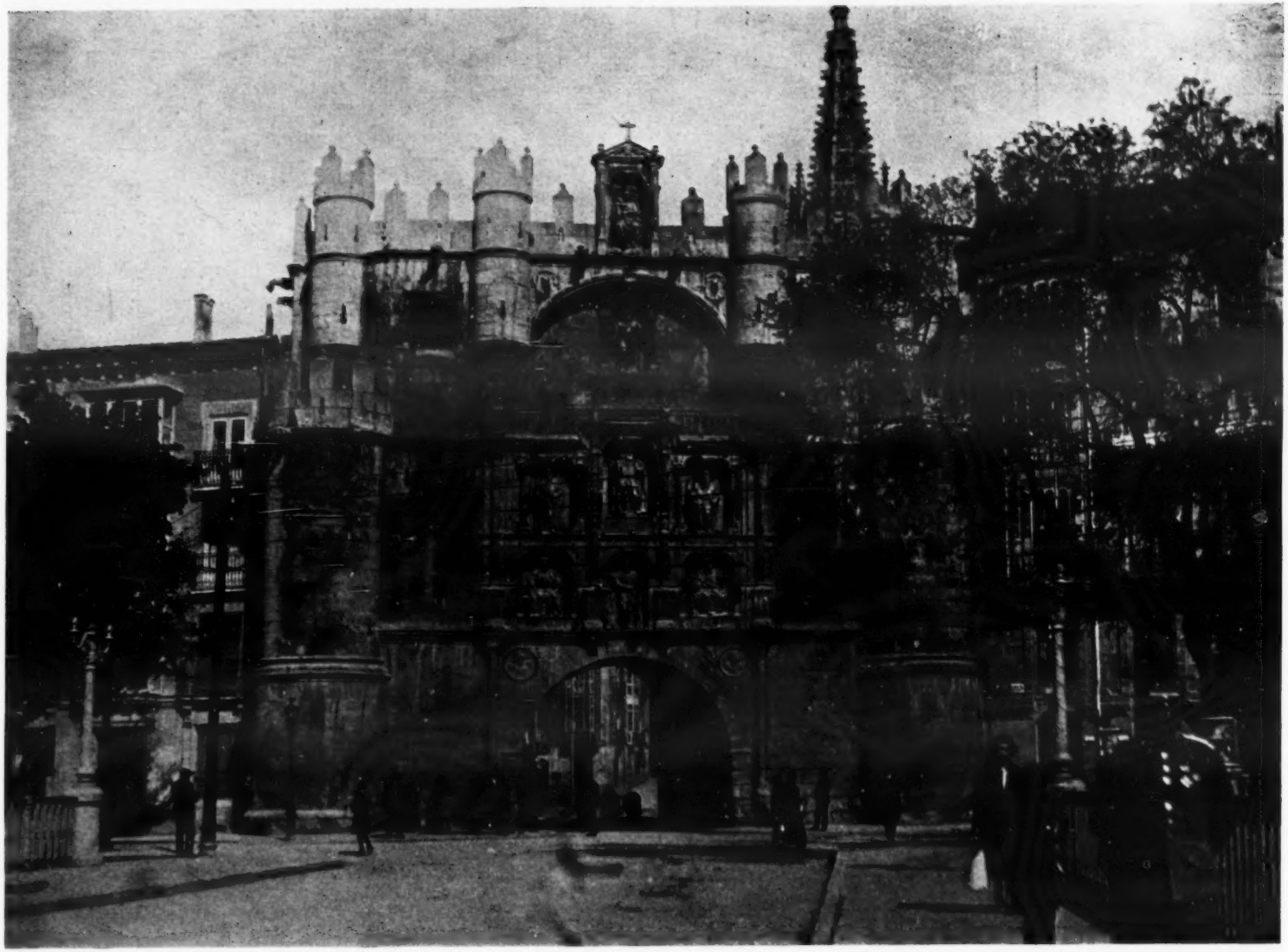


BURGOS—ARCA DE SANTA MARIA

BURGOS—ARCA DE SANTA MARIA

BURGOS—THE CATHEDRAL

more fragile they become until they appear almost as light and sparkling as the air itself. They were built about the middle of the fifteenth century by Hans of Cologne, although the foundations of the Cathedral were laid 300 years earlier by Bishop Maurice, an Englishman. "It is not a little curious," says Street, "and perhaps not very gratifying to the *amour propre* of Spanish artists, that in their great church the two periods in which the most artistic vigor was shown, and the grandest architectural works undertaken, were marked first by the rule of a well-traveled Bishop—commonly said to be an Englishman—who seems to have employed an Angevine architect; and second, by the rule of another traveled Bishop, who, coming home from Germany, brought with him a German architect, into whose hands all the great works in the city seem at once to have been put."

Yet though French and German architects may have introduced the Gothic style into Spain, they remained to become influenced by their environment, and Spanish Gothic, like Spanish Renaissance architecture, has a strong local and national flavor. Besides the two towers of Hans, Burgos boasts a rich octagonal lantern above the crossing, so carved and pinnacled and encrusted with sculpture that the lively Gautier assumed its stony population of saints to exceed the human population of the town. This octagon is borne by four massive piers in the plateresque style and its vault or ceiling, as seen from the pavement of the nave, is intricately carved. "On raising your eyes," again to quote Gautier, "you see a kind of dome; it is a gulf of sculpture, arabesques, statues, little columns, ribs, lancets and pendentives—enough to give you a vertigo. If you looked at it for two years you would not see it all. It is as finely crowded together as the leaves of a cabbage, and fenestrated like a fish-slice; it is as gigantic as a pyramid and as delicate as a woman's earring, and you cannot understand how such a piece of filigree work has remained suspended in the air for so many centuries. What kind of men were those who made these marvelous buildings, whose splendors not even fairy palaces can surpass?"

Hans had a son, Simon, and this Simon built a chapel and yet another octagonal tower. The Capilla del Condestable behind the ambulatory surrounding the Capilla Mayor, or high altar, is apsidal in form and contains the fine tombs of the Constable, the Conde de Haro, who was also Viceroy of Castile and died in 1492—a date which good Americans can recall when all others may have fled. There are numerous other chapels in the bays off the side aisles—and they contain tombs, retables and paintings of bewildering richness. They testify to the religious zeal and material prosperity of Burgos and the changing fashions in which these were proclaimed. [1]The great exterior portal of the Constable's Chapel is one of the finest plateresque compositions to be found in Spain and the Escalera Dorada, that wonderful double staircase of nine and fifty steps, built in 1519 by Diego de Siloe and leading to the tiny Puerta de la Coroneria, is a monumental *tour de force*. Many architects, each in his period, have contributed to this mighty fabric. Even the restless, writhing Churriguera is represented in the Capilla de Santa Tecla. While we strolled about looking aloft or peering into dim recesses, marveling at the carved and gilded altars, or stunned by the sheer force of the Rejas, the priests seated in Philip Vigarni's Silleria were droning their litanies in the Coro. Other black robes flitted about, and kneeling figures, immobile as the effigies toward which they gazed with rapt devotion, gave evidence of the faith that had moved this mountain into being.

A verger, with practiced eye, recognizing the possibility of a peseta or two, beckoned us. We followed him out of the shadowy encrusted cavern of the church itself into the bright sunshine of the Claustro. Here all was lightness and joy. The lovely tracery sparkled in the sun, and in the overgrown tangle of the garden birds twittered, and two young ecclesiastics vied with each other in finding snails under the moist herbage. The cloisters date from the fourteenth century and the four sides of the patio are surrounded by a double row of arches in two tiers. Opening out of one of the eastern bays is the Chapel of Corpus Christi. Here may be seen the famous Coffer of the Cid—the chest which that hero filled with sand and pledged to the Burgos money-lenders who supposed it to contain gold or valuables. It is said that, being a hero, he afterward redeemed it.

The sunshine was bland and the air danced and tingled. Ramps and broad cobbly steps led us around the church and up the hillside into which the Cathedral is built. We stopped at the little church of San Nicolas to see the High Altar and the tombs, and then we climbed on up the hill, where children were playing and women were spreading their wash to dry. From the crest under the decayed ramparts of the Castillo, where the Cid was married in 1074, where 200 years later Edward I of England espoused Eleanor of Castile, and where in 1812 Wellington unsuccessfully besieged the French, we surveyed the silhouette of the Cathedral above the roofs of the town. A choppy sea of rugged brownish tiles undulated below us. We traced the bed of the Arlanzon and the circle of the bull-ring. To the right in a little copse of foliage could be seen the Monastery of the Huelgas and further on the Hospital del Rey. But, except along the Paseo, the glimpses of living green were rare, and the eye wandered over barren wastes of brown to the enfolding mountains in the distance.

There are other things to see in Burgos besides the

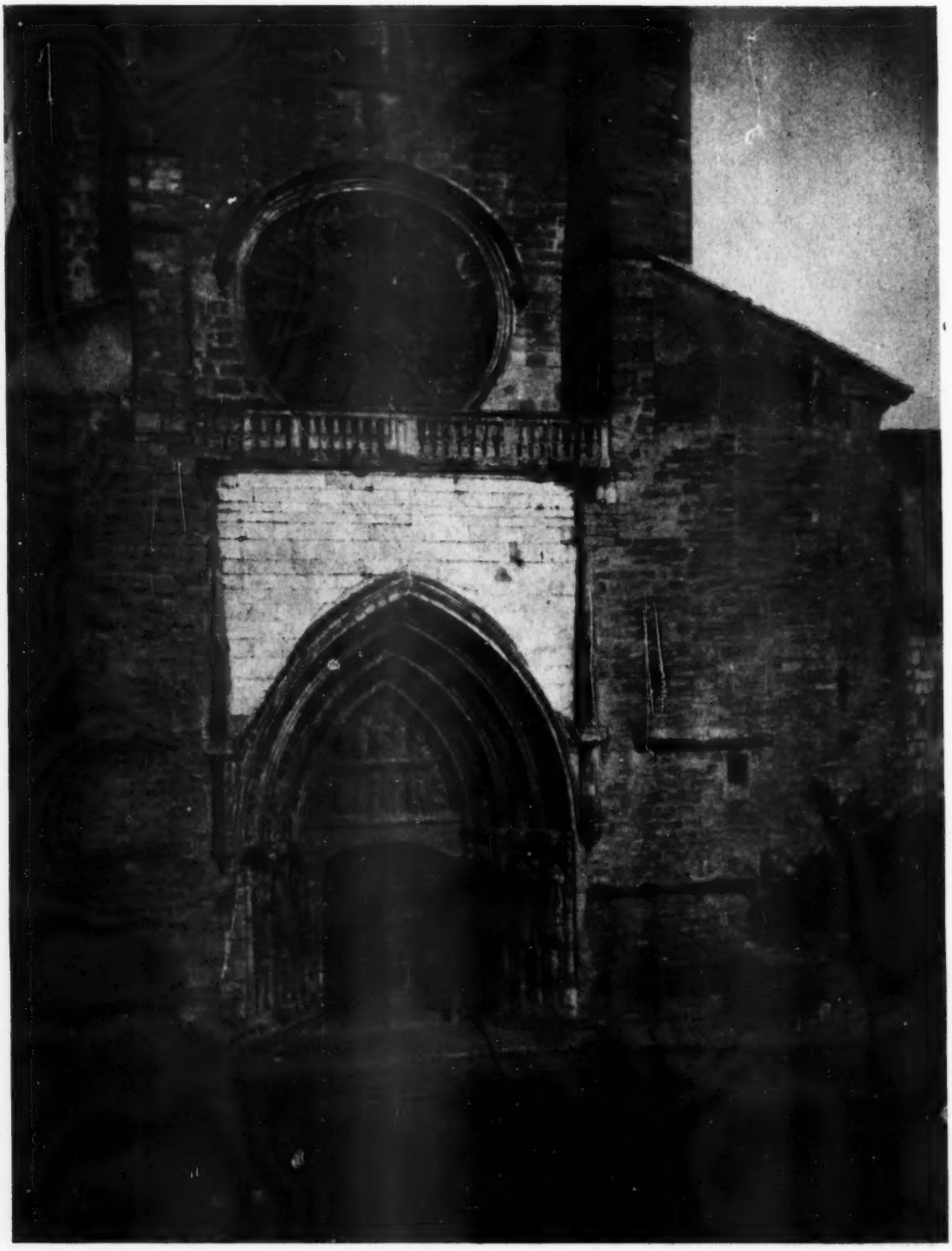
[1] More correctly the lower door of the north transept, called the Puerta de la Pellejeria, built by Francisco de Colonia in 1516.

BURGOS—THE CATHEDRAL—PORTAL TO CAPILLA DEL CONDESTABLE

BURGOS—CASA DE MIRANDA

BURGOS—CASA DE MIRANDA

BURGOS—SAN NICOLAS



BURGOS—SAN ESTEBAN

BURGOS—THE OLD PALACE

Cathedral, although the Cathedral is the lion—the Colossus. It is a venerable town, having been founded in 884. It was the home of the redoubtable Rodrigo Diaz de Vivar, El Cid, who is supposed to have been born in 1026. For a time it enjoyed great prestige as the capital of Castile, but underwent various vicissitudes in the whirl of mediæval politics. As the government became centralized under Charles V the star of Burgos gradually declined, though today the city appears again to show signs of vigor and importance.

The Arco de Santa Maria, the strange and massive gateway through which we entered, was built to appease the Emperor Charles in 1536, but that busy monarch, although his effigy adorns one of the niches along with that of the Cid, was apparently not too much impressed. The Ponte de Santa Maria—a broad low bridge, leads from the gateway across the river to the Barrio de Vega. Here in the Calle de la Calera we found the Casa de Miranda and a number of forlorn Renaissance palaces. Their granite portals, with heraldic blazons and spirited sculpture, bear a kind of defiant witness to their departed grandeur.

The Casa de Miranda now seems to be a warehouse or a factory for making wine skins. We hunted up a workman, who took us into the once beautiful but now sadly neglected courtyard. The slender columns, with their corbelled brackets, are broken and eroded by time and weather. Several of the bays in the second story have been bricked up. The carving of the frieze under the projecting cornice and likewise that of the balustrade is blurred and sometimes all but obliterated. Even the making of wine skins did not seem to get on very happily and the great blown pigs' hides seemed to hang with an air of hopeless dejection. But all the children in the street know that this was once a great house, and they help occasional visitors such as ourselves to gain entrance. The eyes of our guide gleamed as we admired the fine vaulting over the stairway and the graceful strength and delicacy of the colonnades.

Returning to the river we followed along its bank to recross it by another bridge, the Ponte de San Pablo. The Arlanzon is a river in name only and though its banks are parapeted, as if to guard against a swollen flood, its green and grassy bed affords pasturage for goats and sheep and donkeys. Midway between its balustraded sides a tiny stream meanders as though only to maintain its franchise, and groups of kneeling women, to profit by its persistence, bend over the household wash. The views of the Cathedral as we strolled along under the trees were very fine. Some military function was on foot, for Burgos boasts a garrison as well as a priesthood, and smart-looking squads of soldiers went swinging by, led by smarter-looking officers. A blare of trumpets and the roll of drums announced a marching regiment and we stood aside in the narrow street to let it shuffle past. The men this time were dusty from a long march and many wore sandals, which made a padded, muffled sound as they strode by.

The Casa del Cordon, facing a little plaza, dates from the fifteenth century but has been restored with such spick and span precision that the sight of it dried our tears for the neglected Casa de Miranda on the other side of the river. The Gothic cornice and finials are hard and metallic and the gateway with the arms of the builder, the Condestable de Velasco, surrounded by a great carved rope or cordon—his wife's family being connected in some way with the Franciscan order—is more curious than beautiful.

Many of the newer façades in the narrow streets are marred by glazed bay-windows enclosing the second-story balconies as a protection against the rigors of the winter climate, for the plains of Castile alternate between the extremes of burning heat and bitter cold. There is enough of this sort of thing at home and, as sentimental travelers, we sought again the more picturesque by-ways in the purlieus of the Cathedral, the ramped alleys and long flights of steps leading toward San Esteban. This sturdy old church, with its square tower and squat bulky apse, has defied the elements since 1280. It is wrinkled and brown with age and there is something fortress-like and military in its ruggedness, despite its handsome portal and fine rose window.

The Church of the Cartuja is again the work of Hans of Cologne and his son Simon, and was rebuilt after a fire about 1454. The convent was founded by King John II on the site of the royal chateau. A few mild monks in white robes move about and with great courtesy exhibit the treasures of the place. These are treasures indeed and this little church contains two of the finest monuments in Spain, the tomb of King John and his wife Isabella of Portugal, erected by their daughter, the great Isabella the Catholic, and that of the Infante Alfonso, the young brother of the great Queen, through whose premature death she attained the throne. These are both by the master Gil de Siloe, as is also the gilded Retablo of the High Altar. The whole place is sweet and charming.

We drove back in the dusk meditating on the romantic history of this once great city of which, in many of its monuments, so fine a testimony of its stony splendor remains.

LOUIS LA BEAUME.

BURGOS—THE CATHEDRAL—CLOISTERS

BURGOS—SAN ESTEBAN

A Greek Statue from Rome
See page 81

THE ARLINGTON MEMORIAL BRIDGE

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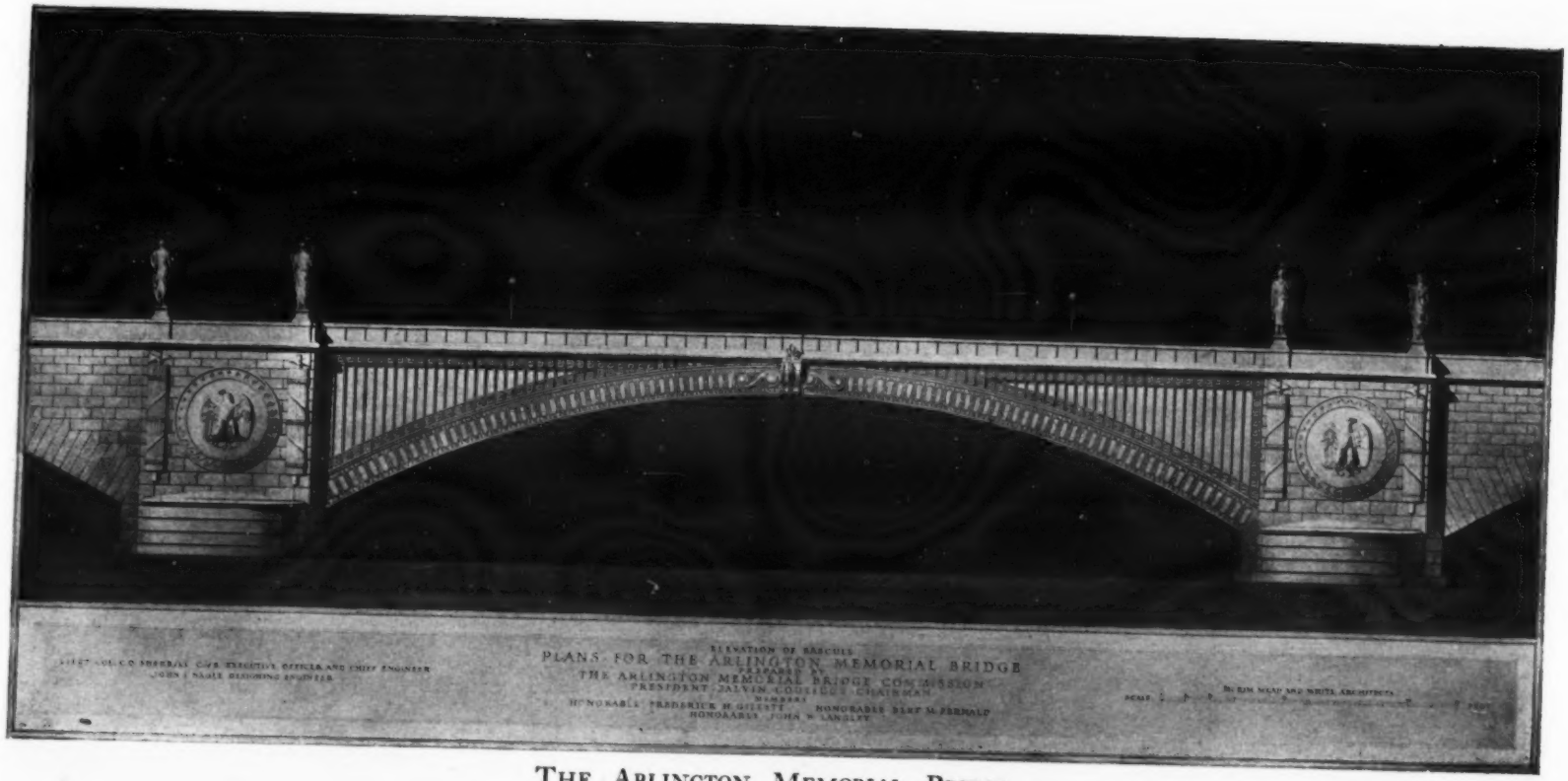
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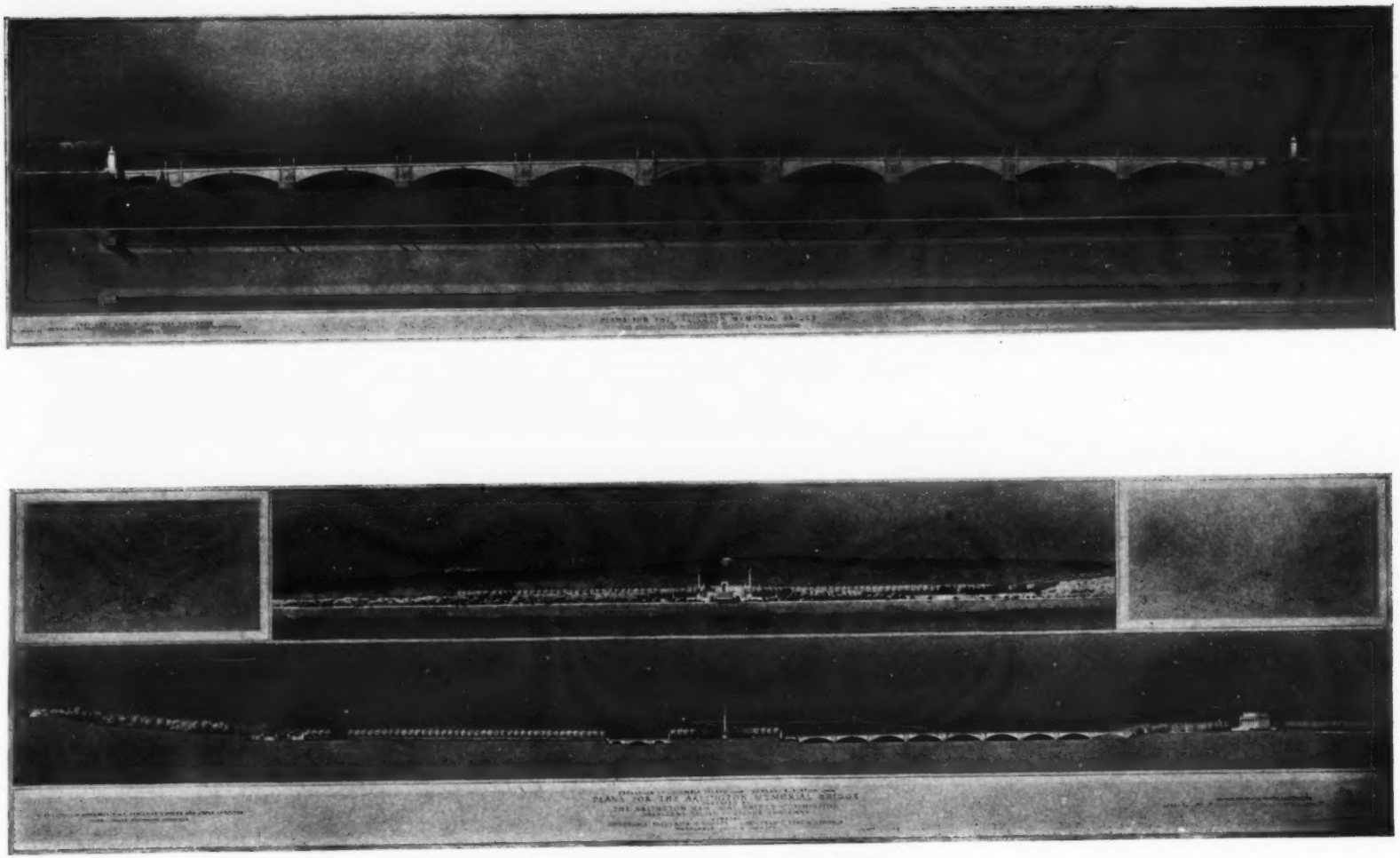

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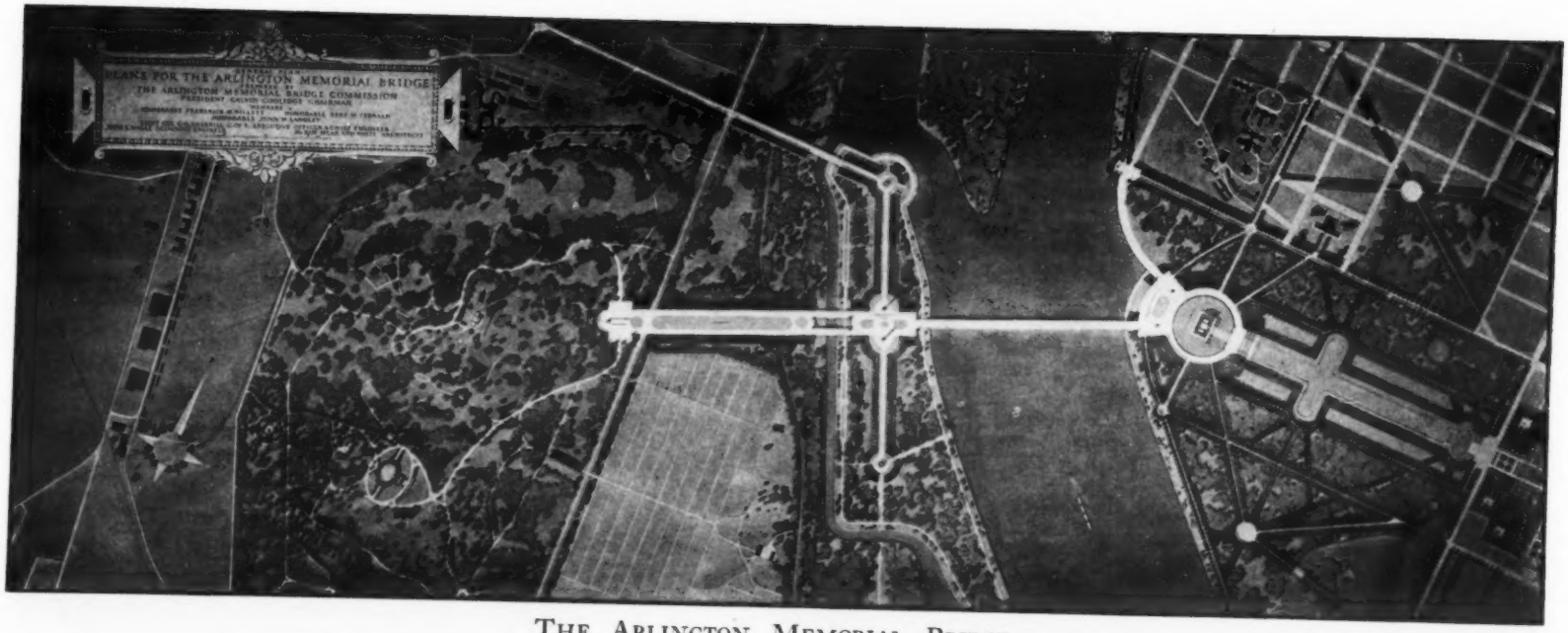
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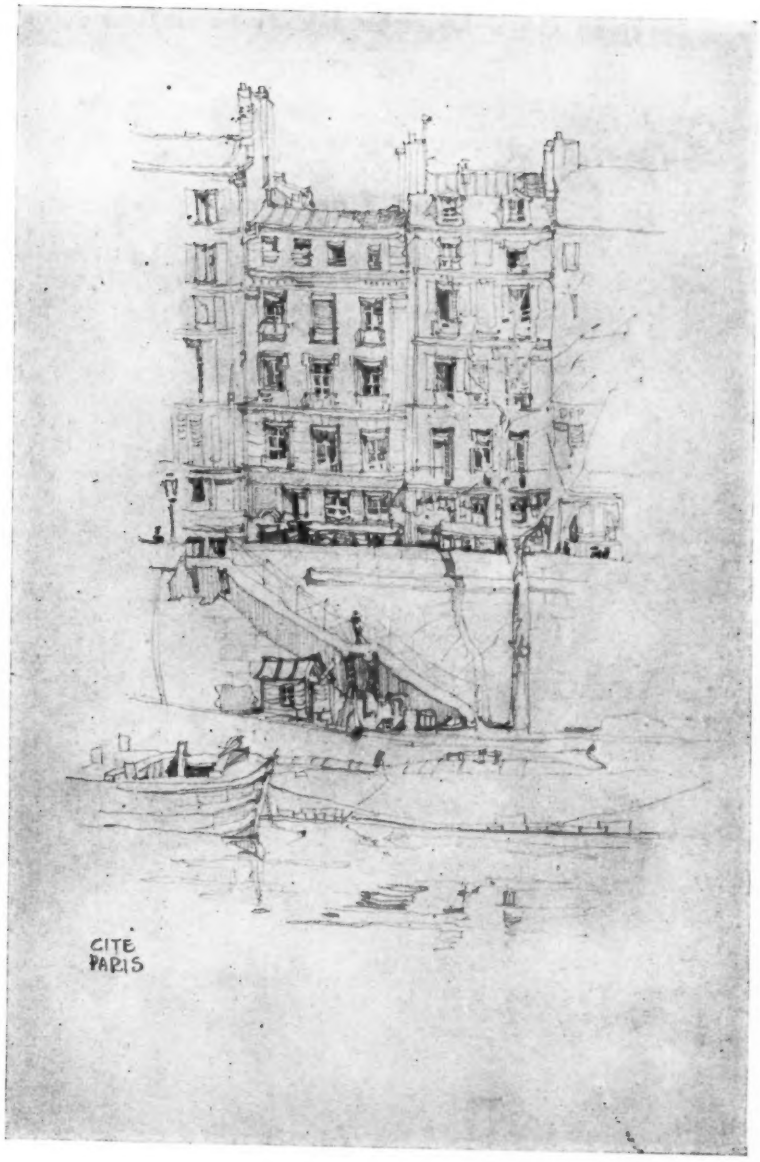
AFTER THE DRAWING
By Ernest A. Grunsfeld, Jr.



AFTER THE DRAWING
By Ernest A. Grunsfeld, Jr.

A Reconstruction of the Basilica of Constantine in the Roman Forum*

Part I

Location and Exterior

In 307 A.D. a great fire destroyed the temple of Venus and Rome and the building along the Via Sacra,[1] giving the Emperor Maxentius[2] an opportunity to re-construct and re-adorn this section. He rebuilt the temple according to the earlier plan but replaced the warehouses for oriental products which stood at the north of the Via Sacra[3] by a monumental basilica,[4] the ruins of which still dominate this part of the city. (Figure 1.)

The building extended along the Via Sacra which formed its southern limit, from the side street which ran north along the side of the so-called *Templum Sacrae Urbis*, to the open space in front of the temple of Venus and Rome. At the north, the basilica adjoined the side wall of one of the buildings of Nero's golden house[5] between which and the basilica a street passed so that the latter was isolated on all sides. (Figure 2.)

Plan

As designed by the architect of Maxentius and before the changes, which will be described later, were made, the main hall of the building had the plan of a Roman Civil basilica. (Plate I.)

It consisted of a nave flanked by aisles and was entered

* The writers wish to acknowledge their indebtedness to Senator Lanciani for the use of his notes and photographs of the earlier excavations to the authorities of the Uffizi at Florence and the Kunstgewerbemuseum in Berlin for placing early drawings at their disposal, to Dr. Ashby of the British School in Rome, and to Director Stevens and the other authorities of the American Academy for suggestions and criticism.

[1] Chronica Minora I, Ed. Mommsen, p. 148.

[2] Maxentius restored Rome to the position of capital of the west. Milan had previously been made the capital of the province by Diocletian. Conservator Urbis Suae appears on coins of Maxentius, Cohen, Monnaies, Vol. VII, p. 171. Maxentius, Nos. 48 and 49.

[3] Throughout this paper the conventional orientation for the Forum and adjoining areas is employed, *i.e.*, the Tabularium is described as facing east rather than southeast, and other structures are orientated accordingly.

[4] Chronica Minora I, p. 146.

[5] Lanciani in Mélanges, 1891, p. 763, also plate III; Nibby, Roma Antica I, p. 51. Canina, Indicator, p. 77.

Fig. 1.—Photograph of Basilica From an Airship
Kindness of Senator Lanciani

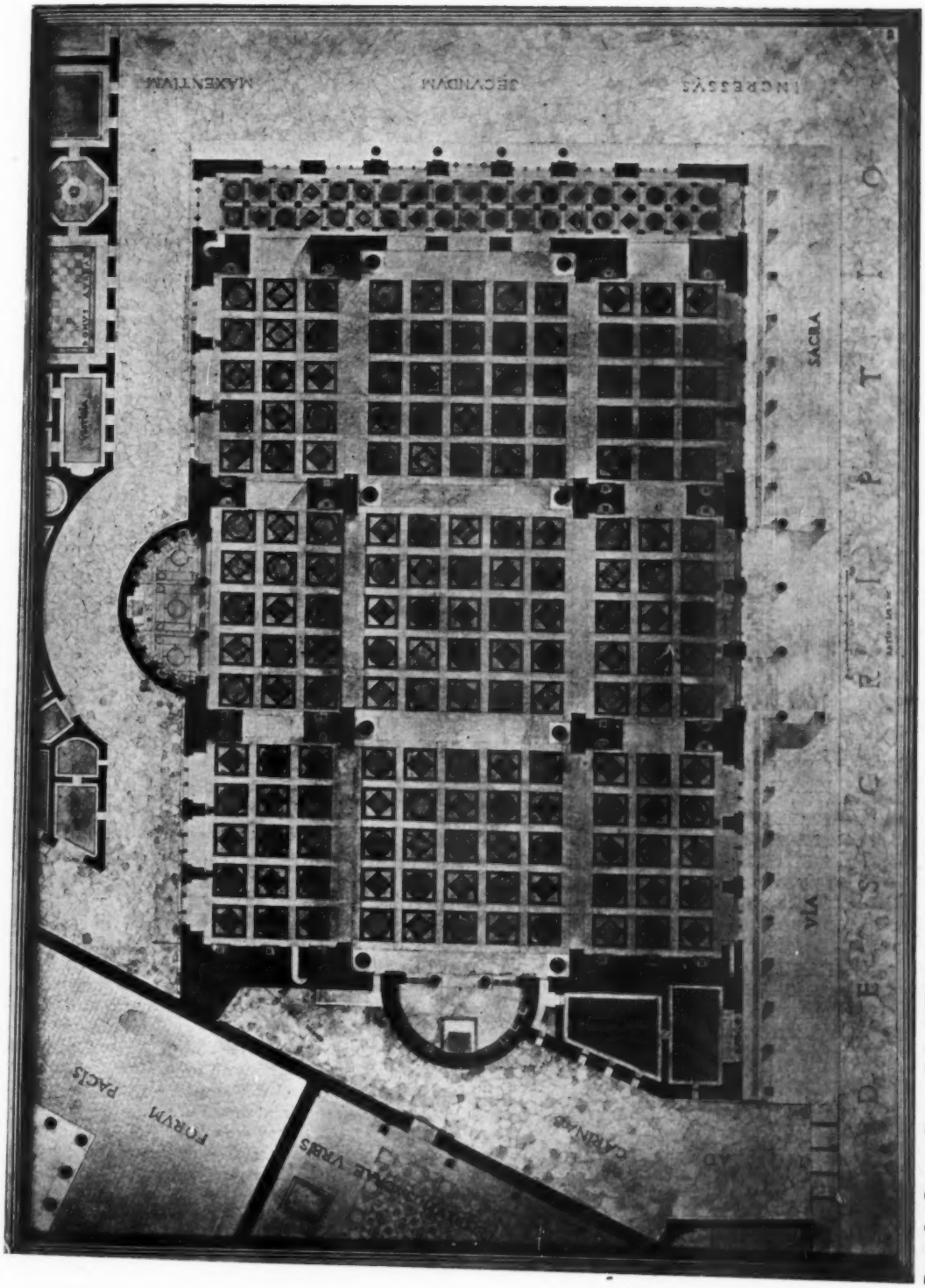


PLATE I.—GROUND PLAN. V. L. S. HAFNER

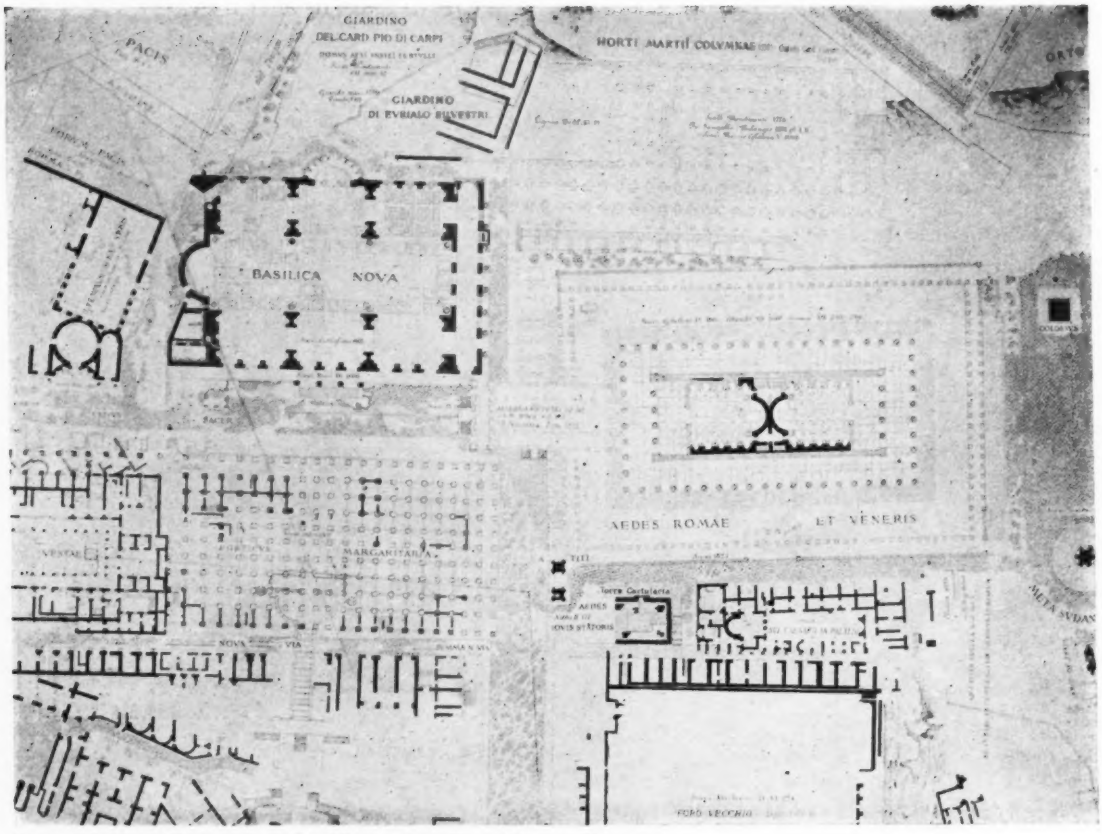


FIG. 2.—GENERAL PLAN OF THE EAST END OF THE FORUM AFTER HUELSEN

from a narthex which extended across the east end opposite the temple of Venus and Rome. The nave, which terminated in an apse fifty-seven feet in diameter, measured two hundred and eighty by eighty-one feet nine inches, wall to wall, with a height of one hundred and twenty-six feet. The aisles were fifty-two feet wide and seventy-nine feet high. The narthex, twenty-three and a half feet deep, was thirty-six feet high. The entire building covered a surface of about one and one-fifth acres, or about twice the area of the central room of the Pennsylvania station in New York.

ELEVATION ON THE VIA SACRA

The south façade of the basilica, as conceived originally by the architect of Maxentius, contributed to form a monumental approach to the temple of Venus and Rome. The retaining wall of the narrow terrace at the south of the basilica is nearly on a line with the north wall of the cella of the temple[6] which was rebuilt according to its earlier foundations. The substructures of the basilica followed the lines of pre-existing walls.[7] The Maxentian level of the Via Sacra was probably not much higher than that of the road which existed just before the fire of 307 A.D. It was undoubtedly widened and repaved by Maxentius. This pavement was discovered in 1882.[8] (Figure 3.)

The stones were worn as if from long use and showed signs of lack of repair. They were removed in 1901[9] to show the earlier line of the Via Sacra which is the road now visible. It dates from the first century B.C. The sides of the road were lined with dedicatory statues, pedestals of which were found in the course of excavations.[10] Probably a much greater number were converted into lime or used in buildings in later periods. The Via Sacra widened into an open space in front of the temple of Venus and Rome, where part of the pavement is still *in situ* in front of the church of Santa Francesca Romana. As the road ascended, it left uncovered a triangular portion of the face of the substructure of the basilica. Probably this was covered with stucco, as

[6] See the Engineer's plan of the Forum and adjoining areas, Section 6.

[7] The pre-Maxentian structures along the Via Sacra have been studied in detail by Dr. E. B. Van Deman. The results of her work will be published in the near future. I wish to acknowledge Dr. Van Deman's help in my study of brick-construction.

[8] Not. Scavi, 1882, p. 216.

[9] Huelsen, R. F., p. 227.

[10] Corpus of Latin Inscriptions VI, 1653, 1663, 1696. Not. Scavi, 1882, p. 219f. Some of the structures mentioned here had probably disappeared by the time of Maxentius.

FIGURE 3.—MAXENTIAN PAVEMENT OF THE VIA SACRA. KINDNESS OF SENATOR LANCIANI

there are no traces in the facing of holes for clamps which would have been required had a veneer of marble been used.

THE TERRACE ALONG THE VIA SACRA

The substructure projected beyond the wall of the basilica for its entire length forming a terrace 7 feet 4 inches wide. Then in the course of construction or soon after, the portion along the central bay, a distance of 66 feet, was widened to 16 feet 4 inches. The absence of bonding at the sides of this projection is apparent. The floor level here is about 6 inches below that of the rest of the platform, as is shown by a step in the layer of tiles which are still *in situ* to a great extent. The terrace could be reached directly at the east, from the square in front of the temple of Venus and Rome.

The end wall of the narthex at the east was balanced at the west by the slightly longer wall of a room adjoining the central hall, formed on the substructures of earlier buildings. This room concealed the lower part of the apse from the Via Sacra. The south façade, with the exception of the extreme ends, rose to a height of 79 feet above the terrace. It was pierced by two tiers of arched windows arranged in groups of three corresponding to the three bays into which the aisle was divided within, except in the center of the lower tier where three doors opening on the terrace took the place of the windows in the side bays. The three main divisions of the façade were carried out above the sloping roof of the aisle by buttresses. These received the side thrust of the three groined vaults which roofed the nave. The clerestory was 47 feet higher than the aisles and admitted light to the interior through three huge lunette windows at each side and one at either end. Each of the aforesaid buttresses is pierced with an arch to lighten the mass and to afford a means of circulation on the roof. Have we here the prototype of the flying buttress? (Figure 4.)

ROOF

The roof was covered with clay tiles, marks of which are visible in the concrete of the fallen portions of the vault. It has been stated[11] that bronze tiles were used as covering. This opinion is derived from a statement in the *Liber Pontificalis*[12] that Pope Honorius took the bronze tiles from the temple of Rome to use for the roof of old St. Peter's. The building mentioned is identified with the basilica; for it is argued that the roof of the temple of Venus and Rome would not have furnished a sufficient number of tiles. Yet there would have been enough if the colonnade which enclosed the temple area were roofed in the same manner. Besides, the wooden beams of the saddle roof of this temple would be more likely to require as protection from the weather a light

[11] Duchesne, Melanges, 1886, pp. 25-27.
[12] Lib. Pont., Vita Honorii, § 119, III.

metal covering, which would be entirely superfluous in the case of a solid concrete vault. Moreover, the measurements of the prints[13] of the tiles in the vault show variants in dimensions incompatible with the care which would have been taken in laying tiles of more expensive material.

The cornice of the roof was formed of travertine brackets, supporting tiles which were covered with mouldings run in stucco. Remains of this cornice are still visible at the east end of the building. Travertine water spouts were embedded in the cornices at the north and south to throw the rain away from the walls. Several of these are now lying on the roof of the north aisle.

Wall Decoration of Outside

The outside of the building was stuccoed in imitation of finished ashlar, part of which was seen on the east face by Nibby, one of the early archæologists.[14] A portion of one rectangle still clings to the fragment of the corner of the building which lies in the forum of Peace. An engraving of Rosini shows how the east face appeared a century ago. The combination of this decoration with a stucco cornice on a tile foundation is also still visible in the nearly contemporary senate house of Diocletian. Renaissance drawings show that this decoration was also employed in the baths which the same emperor constructed.[15] A second cornice of tile and stucco ran above the lower line of windows at the height of the cornice of the single story narthex[16] at the east. It probably joined the cornice of the marble entablature supported by the four porphyry columns which formed a portico above the wide part of the terrace on the south, and extended at the west along the roof of the single story construction which adjoins. The small room at the southwest corner of the basilica, as appears from a careful examination of the bricks, had a single arched window which balanced the door in the end of the narthex at the east. The flat wall which now conceals this arch from the front is a later addition.

At the bottom of the outer wall, just above the terrace, ran a marble base, as is shown by traces of concrete bedding which adhere to the lower part of the wall. This base served the purpose of protecting the stucco from damage by dampness or blows. At the edge of the terrace there must have been a balustrade, perhaps similar to that which stood at the foot of the steps leading to the temple of Venus and Rome, where the groove on which it rested is still discernible in the travertine pavement below the first step. The terrace was paved with marble for which there are traces of bedding on the levelling layer of roof tiles which are still in place to a great extent. The original level was later raised in front of the central bay by a layer of concrete composed largely of marble fragments, some of which are pieces of fluted pilasters. The original pavement was probably relaid at a higher level in this section of the terrace.

[13] The length is about 40 cm. (16 inches), the width varies from 25-35 cm. (10 to 14 inches) between the portions which overlapped.
[14] Roma Antica II, pp. 238-49.
[15] Rivoira, Arch. Rom., p. 243; Lanciani, R. & E., p. 44; Atti dei Lincei, 1883, Plate III; Du Perac, Plate 2, 26, 30.
[16] Not. Scavi, 1879, p. 264; Mélanges, 1891, p. 164.

FIGURE 4.—PHOTOGRAPH OF BUTTRESS

Central Portico

The portico at the center of the terrace was principally a decorative element, although the doors would serve to facilitate the entrance of large crowds and prevent congestion in the narthex. Across the front of the portico were four red porphyry columns with very wide intercolumniations. The axial unit is 17 feet. Architrave blocks of such dimensions were rarely used. The central architrave blocks of the Propylæa at Athens were 17 feet in length.[17] The century preceding Constantine was a period of gigantic structures such, for example, as the temple of Baalbek, the longest architrave blocks of which are ascertained to have measured 17 feet 11 inches.[19]

The capitals of the columns were probably of white marble.[20] Porphyry columns are used with white marble capitals in the Lateran baptistry. The latter were contracted for by Constantine under Pope Silvester but not set up until the time of Pope Xystus (432-440) according to the *Liber Pontificalis*. We have placed a statue above the cornice over each column. Behind the columns, between the windows, were probably pilasters, as there are places for the plinths, which were later removed, in the concrete poured over the original level of the terrace. That this porch was part of the original design is shown by what remains; for the foundations of the columns, torn away by the weight of the falling columns when the building collapsed, or hacked out in the Middle Ages, were embedded in the concrete mass of the substructures.[21] If the columns had been added later, it would not have been necessary to sink foundations in already existing concrete, as the weight which the columns supported was comparatively slight. The holes, left by the removal of the blocks of travertine which formed the original column-foundations, were filled in when the fragments of the columns were set up by the modern restorers.

Windows

The windows were fitted with travertine sills. Some

[17] Praktika Athens Archæological Society, 1909, p. 115.
[19] Schulz und Winnefeld, Baalbek, I p. 66.
[20] Portions of the porphyry shafts were found in 1487, 1819, and 1878; see Not. Scav., 1878, p. 139. The top of the column set up at the west corner of the terrace has a vertical segment cut from it. This might suggest that it was used as a three-quarter engaged column against the wall. Clamp, dowel, and pour channels, however, visible on the upper surface, point to the fact that the column had been broken and restored by clamping on the portion to complete the drum.
[21] Fea. Bas. Const., p. 14, mentions these parts. One is at the right of the core of the steps.

of these were found in the debris and replaced in modern times in the windows made by partially filling in the doors of the central bay. The sills show sockets for the mullions which divided the windows vertically into three equal parts. The outer edges of the window screens were embedded in grooves which can be traced in the brick facing at the sides of the window openings at the east of the south façade. Here also occur at regular intervals the sockets into which the muntins were fitted. This shows that the screens were of heavy material, bronze or marble, which required a firm attachment.[22] In our restoration we have used bronze screens in harmony with the bronze doors, varying the tracery in the panels of each. The large size of the windows led us to adopt this variation rather than a uniform pattern. Varied tracery was used in the screens of the church of Santa Sabina, but these date from the eighth or ninth century and furnish no definite evidence for earlier buildings.[23] In a building of such magnificence we should suppose that the windows were glazed, although an unclosed public building would not have been impossible in ancient Rome, the inhabitants of which were accustomed to endure a greater degree of cold than we generally suppose, holding court out of doors throughout the year and living in unheated and open houses. Glass was used to some extent in windows as early as the time of Caligula in the first century.[24] Fragments of sheets of glass have been found in excavations both in Italy and in Roman provinces of more northern countries. The glass is thicker than the modern product and of a greenish hue. The largest of the plates found measures only 15 inches in width, but, set in the elaborate window screens, these dimensions would have sufficed. The excessive cost of the amount of glass required for the basilica of Constantine makes its use seem unlikely. Probably one of the substitutes, such as selenite or thin plates of marble, which were known to the Romans, was used in this case. Selenite, a metamorphic form of calcium carbonate, was used in the ninth century re-building of the church of Santa Sabina, referred to above. The same material has been employed again by the modern restorers; in this instance the amount of selenite quarried near Ravenna cost 12 lire for each window; a corresponding amount of glass would have cost 900 lire.

The Doors

The doors of the building were in all probability of bronze similar to those still in place in the so-called temple of Romulus, which is contemporary with the basilica. Of about the same period are the portals of the Lateran, which were taken from the senate house of Diocletian by Pope Alexander VII. In our restoration we have used, in the lunettes of the clerestory, screens painted to harmonize with the wall decoration of the interior. These screens were probably made of wood covered with stucco; in buildings of moderate size they are sometimes made of marble.

[22] The frames of the windows of the Villa of Sette Bassi were probably of wood fastened with clamps, and so there are no visible sockets for supports.

[23] Muñoz, La Basilica di Santa Sabina, pp. 29-30.

[24] Kisa, Das Glas in Altertum, p. 362.

Changes in the Facade Under Constantine

We are informed that after the overthrow of Maxentius the senate dedicated to Constantine the buildings which the former had erected,[25] namely the *Fanum Urbis* and the basilica. (The former has recently been identified as the building connected with the so-called round temple of Romulus.[26]) The use of the pluperfect tense of the verb *construxerat* in the passage referred to would seem to indicate that the basilica was completed or very nearly completed at the time. The inscription dedicating the round temple to Constantine was available in part in the sixteenth century when it was copied by Panvinius.[27] It seems probable that Constantine in taking over the basilica inaugurated the change in plan, which, as the construction shows, was very nearly contemporary with the main structure. Constantine made a new entrance from the Via Sacra and probably placed his inscription on the already existing portico.[28] A flight of steps was constructed against the front of the portico to the Via Sacra, making the terrace accessible from this street. The upward grade necessitated the use of ten full steps besides three at the left which extend only partly across the length of the flight.[29] The stairs were flanked on either side by a rectangular bastion. The coarse rubble core of the steps is simply built against the earlier brick facing of the terrace wall with no bonding. The steps and bastions were doubtless veneered with marble. We have crowned each bastion with a seated statue.

Previous Restorations of the Outside

Several authors[30] describe the outside of the basilica as decorated with one or more rows of engaged columns. They base these statements on a comparison with the remains of the basilica Julia and with the evidence afforded by a series of perspective plans of Rome dating in general from the fifteenth century. Since the structure of the basilica Julia differed organically from that of the building under discussion, its external decoration can afford no clue to the adornment of the latter.

Of the early plans of Rome,[31] all point to a common

[25] Aurel. Vict., Vita Const. 40.26.

[26] Whitehead, SS. Cosma e Damiano, Bull. Arch. Christ. XIX, 1913, p. 164.

[27] C. I. L. VI, 1147.

[28] Not. Scav. 1879, p. 313, reports the finding in the street between the basilica and the round temple of a marble fragment with four large letters which were originally inlaid with bronze. No dimensions are given. The letters are S T and beneath I O. As the S T fits the name of Constantine, this was identified by Senator Lanciani, who conducted the excavations, as part of the inscription of the basilica. I have endeavored to reconstruct it as follows. I O fits PIO only of Constantine's usual titles.

(a) IMP. CAES. FL. CON(ST)ANTINO
(b) FELICI. MAXIMO. P(IO). TRIUM
(c) PHATORI. SEMPER. AUGUSTO
S P Q R

(a) Inscription on arch of Constantine, CII VI, 1139.
(b) Unusual order, CII VI, 1140.
(c) CII VI, 1141, Caballus Constantini as quoted by the anonymous of Einsiedeln.

[29] The entrance of the basilica Julia is managed in the same way with seven steps at the east and only one at the west near the slope to the Capitoline.

[30] Middleton II, p. 228; Thédénat, p. 346.

[31] De Rossi, Piante Iconografiche di Roma antenore al secolo XVI 1879; four plans, supplemented by
1. Stevenson, Bull. Com. 1881, pgs. 74-105, Pl. III-IV, Di una Pianta di Roma dipinta da Taddeo di Bartoli (1413-'14);
2. Gnoli, ibid, 1885, pp. 63-76, Pl. IX-XV. Di alcune Piante Topografiche di Roma ignote o poco note;

original, possibly dating from the thirteenth century. They represent, in the neighborhood of the Colosseum, three contiguous arches with single or double columns between them. In a Paris codex of 1447,[32] the name of Templum Paris, as it was then called, assures us of the identification of the structures. Yet such an arrangement of the façade is incompatible with the evidence of what remains; for it shows neither the portico of the south face nor the single story narthex at the east. The north side of the building, which faced a narrow street, would have shown the projecting apse. Moreover, from the orientation of the plans, it is the south face which is represented. We must conclude that these drawings show what remained of the basilica after the collapse of the nave and south aisle, namely, the three arches of the north aisle with the adjoining columns of the nave. Somewhat similar to this is the view of the ruin with two columns still standing, though only one has a capital, in Bramante's sketch made about the year 1500.[33] We know that by this time the pavement was entirely covered.

East Facade

According to the original plan, the principal entrance to the basilica was at the east from a street which ran north from the Via Sacra with a slight upward inclination. The narthex was only one story high, as the front wall above it shows no traces of the roof of a second story built against it. Entrance was gained through three doors; there was a door in each end of the narthex—the brick facing at the north shows that a doorway, not a window, occupied this space, and the same was probably true of the opposite end, although here the original facing at the bottom of the piers has been restored; in the front wall of the narthex there was a single door with three windows on each side. At later periods the two windows at the north were filled in and the others cut down to form entrances, as the facing shows. The same type of window screens and doors were probably employed at the east as at the north and south.

Decoration of Exterior of Narthex

Along the roof of the narthex we have restored a stucco cornice. The fragments of granite columns found in the debris, which are of the same dimensions as the porphyry columns of the south portico, probably indicate the architectural adornment of the east face. On the principle of symmetry, we have assumed that there were four of these columns because of the existence of the four porphyry columns of the south portico. The use of only four columns also served to continue the lines of the nave at the façade. We accordingly reconstructed the portico with one column at either side of the central door and one between the first and second windows on each side. We used capitals of white marble, as in the case of the gray granite columns of the early tomb church of Santa Costanza, and a marble entablature, broken and extending back from each column to a corresponding pilaster against the wall. This method, first used in the Forum of Nerva, appears also in the arch of Constantine, in columns which were added by that emperor to the earlier concrete core of the structure. Above each column we place a statue. Renaissance artists solve the problem of these columns in verious ways,[34] using one between each two windows, eight in all, or sometimes more slender columns in pairs.

Nibby disclaimed the use of columns in this part of the building because he found no traces of foundations when he excavated in front of the narthex.[35] The travertine blocks on which the columns rested, were probably removed in the middle ages, as were those of the south portico.

The east face of the building was stuccoed to represent finished ashlar.[36] Above the narthex the front wall of the nave was pierced by three arched windows. The side of the one at the right can be seen in the edge of existing section of the front wall. The triangular front of the clerestory had a single lunette window similar to those in the triangles at the sides of the groined vaults. This façade, with the single story narthex, three arched windows above it in the front wall of the buildings, and a gable end of the roof surmounting this, is similar to the scheme adopted for the early churches, and, in fact, is still to be seen in Santa Maria in Cosmedin and others.

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3. Visconti, ibid, pp. 77-82, Pl. XVI, Una Pianta di Roma del Secolo XIV pubblicata dal Sig. Muñoz;
4. Huelsen, Bull. Comm. 1892, pp. 38-47, Plates II-IV, Di Una Nuova Pianta Prospettica di Roma del Secolo XV.

[32] De Rossi, plate II, 2.
[33] Uffizi No. 1711.
[34] Vasari Giovane, Uffizi No. 4809—three doors in center, ten columns. Baldassare Peruzzi No. 437, 543 and Lorenzo Donati No. 200, used eight columns as did Caristie in his restoration made after the excavations of 1819.
[35] Loc. cit.
[36] See above, p. 10.

(*To be continued*)

A Greek Statue from Rome

The statue illustrated on page sixty-three of this issue was found in 1915 on the Palatine hill at Rome by Commendatore Boni, during the course of a clearance excavation. It is of Greek marble, about half the scale of a full-size human figure. It was called by its finder a figure of Victory and was, by him, held symbolic of the coming Allied victory. Pictures of it appeared in some of the Italian illustrated journals, but little news of it reached outside and it has not yet been published. It now lies inside the villa of Commendatore Boni on the Palatine. A cast of it has been erected in the Pergola of the beautiful garden that flanks the villa and overhangs the Forum.

The statue does not represent a Victory but rather a nymph or water-Nereid moving rapidly to the right. It is cut with the utmost delicacy and is a work of Greek sculpture of the greatest beauty and importance of the end of the fifth or beginning of the fourth century B.C. The grace of the moving figure and the lightness of the drapery at once suggest comparisons with the sculptured balustrade of the little temple of Wingless Victory at Athens. The drapery shows the same lightness of touch and the same easy folds. The garment worn is the Attic peplos girt on both shoulders and with a fold of drapery, called technically an "overfall," that covers the breast with a double thickness, but hangs free and is not girt in at the waist, as is usually the case with garments worn by the Victories of the Athenian temple. In general style and build the figure resembles, perhaps more closely, the statues of Nereids on the so-called Nereid Monument from Lycia, the sculptures of which are now in the British Museum. The new statue, therefore, has a great interest for students of sculpture. The Nereid Monument itself may, perhaps, belong to the fifth century. Comparisons are even possible with the figures of the pedimental sculptures of the Parthenon itself, though these are admittedly earlier in date than the Palatine statue; nevertheless, the artist of the new sculpture was not ignorant of the best technique of the fifth century and had clearly studied such figures as the Iris of the Parthenon pediment or the Victory of Pæonios at Olympia.

How the statue had reached Rome is a mystery, but so many fine Greek works of art were taken by Roman officials and Emperors from Greece that there is nothing startling about such a discovery. One has only to cite such masterpieces as the Ludovisi throne or the Venus of Capua to realize that Greek art had paid its full tribute to the connoisseurs of Rome. From as early as the sack of Corinth in 146 B.C., Greek statues had been imported steadily into Rome and other towns of Italy: Sulla, Tiberius and Nero each transferred vast numbers of Greek statues to Italy. Many reached the Roman cities from the Greek cities of Italy, such as Tarentum, whether as the booty of conquerors or through the market.

This small but exquisite work of art must have reached Rome in some such way and have been one of the numerous works of art in the imperial palaces on the Palatine. More precise information as to its origin can hardly be expected. Its chief importance lies, perhaps, in the fact that it belongs to a very rare type of statue. Figures of half the natural scale, and cut in the round rather than in relief, are by no means common, either in Greek museums or in those of Italy. This figure is so cut that it can be seen from any side, though the front view is the most beautiful and clearly that from which the artist expected it to be seen. Probably it was, like the Victory of Samothrace, on the summit of a monument, perhaps a pedestal or pillar.

S. C.

On Certain Differences Between "More" and "Better"

Some ten or twelve organizations (with names giving assurance of the importance of their participation) collaborated with the National Housing Association in a conference held in Philadelphia on 5, 6, and 7 December, 1923.

The layman or technician who attended this conference could not but be impressed by the variety of opinion which was both promised by the program and expressed by the speakers. It should be recognized at once that the National Housing Association is not a technical society. Its meetings, therefore, must include much talk, and considerable emotional inspiration. The real way to estimate the value of such a meeting is to read the newspaper stories appearing at the moment, to read the printed "Proceedings" which are issued afterward, and to consider that the meeting is a periodical one, continuing a portion of the public thought (!) over calendar periods.

One of the sessions was devoted to zoning. As we have already implied, technical discussion occupied little time. There was no analytical consideration of the "area regulations" of zoning ordinances and their bearing upon housing. The discussion was largely general, the arguments, the familiar ones, obviously energized to coerce the reluctant spirit of unzoned Philadelphia. Judgments were given upon the wisdom or success of zoning by those who had had more or less contact with the machinery of its operation. The dominant note appeared

to be "approval, with qualifications." This in itself is always a matter of interest to those who would focus their minds upon public opinion. Incidentally, and apropos of one of the excellently presented and interesting papers, we were forced to acknowledge the æsthetic stimulus of speculating upon the modeling of the upper portions of tall buildings—say from the tenth to the fiftieth story. Visualized, this speculation even partakes of the dramatic. We like this sort of stuff. It's bully! But, God bless you, it is but a trivial phase of zoning after all. What about the occupants of the first ten stories? And why waste time on this when there are more vital aspects of zoning (the area regulations, for example) which should receive searching and critical re-examination? However, this was not a technical gathering, and one should not expect too much from a revival meeting. And anyway, there is a suspicion that Philadelphia will in due course get up on the mourner's bench (band-wagon) and be saved.

In passing, one must mention the regulation "round table luncheons" wherein each one tells every one else collectively and publicly the same things he has already told them individually just outside the convention room door during the reading of papers.

But to return to the main tent. One might best summarize the heterogeneity of opinion by noting that neither individually nor collectively was there a thought of a synthetic exposition of the housing problem or of a program for its solution. If we assume that the housing problem is caused by the operation of two divergent forces we can find the theses of most of the speakers more readily understandable. Since the element of cost (of land, of money, of materials and of labor), together with the element of profit inherent in all business transactions, pull in one direction, and since the personal and social needs of human beings express a pull in the opposite direction, we can see the temptation for the concrete human mind to devote itself to balancing the strain of the two forces. (In the meantime this process becomes the more exciting and intriguing by reason of the variable purchasing power of the dollar.) But more often the effort is made to reduce the pull of the human demands and to cite insuperable obstacles to reducing the cost and profit demands. In the present meeting the emphasis appeared to be upon the human concessions which might result in cost reduction, the cost saving being the thing desired. Most interesting researches looking to efficiency were reported, but the details are too lengthy to be here reviewed. The speakers variously called for the encouragement of thrift, for proper utilization of the potential and actual resources of savings banks and building and loan associations. Eradication of seasonable unemployment was indicated as promising savings in construction cost as well as increasing the purchasing power of the worker. Others would throw open additional reservoirs of credit, such as postal savings. Reducing the cost of building by reducing the cost of labor was not forgotten. With one or two marked exceptions the observer of the meetings felt that "ingenuity" was the *ne plus ultra*. There was no come-back when some one implied that, after credit had been extended to the limit, there might remain still unsolved the basic difficulties of the housing problem.

One may quite fairly and frankly express disappointment at the lack of evidence of a *growing* body of analytical and constructive thought applied, first,—to the understanding of the economic and social forces which underlie the housing problem and, second,—to devising and promoting not a revolutionary millenium but a long-term evolutionary program definitely oriented toward a specific goal. We should like to think that there are increasing numbers of citizens who will conceive the whole housing problem and its solution as a synthesis. But observation of this meeting, where one would naturally expect to find something much superior to newspaper reporting disguised as editorials, or superior to legislative discussions, is like a cold shower. We bump our own concrete head against the velvet wall and realize that up to date society stumbles along, patches up here and there, and ever and anon is either expedient or dodges the issue completely. This is life, at present, and as *the present* is that which enchains, bewilders, and drugs us, few care to listen to voices from the past. But in his very wonderful essay on "Government by Talk,"[1] Mr. Jacks begins by drawing a parallel between the address of Mr. Lloyd George on the occasion of his induction to the Rectorship of Edinburgh University in 1923, and the address of Thomas Carlyle, on a similar induction to the same office in 1866.

Said Mr. Lloyd George: "Judging from the specimens I have seen, great doers are also great talkers. Some of the greatest business men I have ever met talk like the Gulf Stream. The strong, silent man may have roamed the earth in prehistoric days, but . . . I feel sure he must now be as extinct as the mastodon. But with politicians speaking is an essential part of their business. . . . Parliamentary government means etymologically as well as in reality government by talk . . . In a free government you must talk your way to good government, for there are so many to persuade. . . . A programme is successful when a truth becomes a tag. That is the result of talk. It is the only method ever known of running a free government. . . . The men, therefore, who despise talk themselves talk nonsense, and mischievous nonsense at that."

Said Carlyle: "Oh, it is a dismal chapter, all that, if one went into it—what has been done by rushing after fine speech. . . . There is a very great necessity indeed of getting a little more silent than we are. It seems to me as if the finest nations in the world—the English and the American in chief—were going all off into wind and tongue. But it will appear sufficiently tragical by and by, long after I am away out of it. There is a time to speak and a time to be silent. Silence withal is the eternal duty of a man. . . . Why tell me that a man is a fine speaker if it is not the truth he is speaking? . . . If a 'good speaker,' never so eloquent, does not see into the fact, and is not speaking the truth of that, but the untruth and the mistake of that—is there a more tragic kind of object in creation? Of such speech I hear all manner of people say, 'How excellent!' Well, really, it is

[1] *The Hibbert Journal*, October, 1923.

not the speech but the thing spoken that I am anxious about. I really care very little how the man said it, provided I understand him, and if it be true. Excellent speaker? But what if he is telling me things contrary to the fact? . . . An excellent speaker of that kind is, as it were, saying, 'Ho, everyone that wants to be persuaded of the thing that is not true, here is the man for you!' I recommend you to be very chary of that kind of speech."

And Mr. Jacks continues: "If there is any tag in existence which deserves to be called the 'winning tag,' we surely have it in 'improved conditions'—better houses, better food, better clothes, and so on through the familiar list. Now, 'getting down to cases,' as Mr. Babbitt urges us, or 'letting our consciousness play freely round the facts,' as Matthew Arnold has it, or 'looking into origins and issues,' as Carlyle would say, is it not obvious that these 'better conditions' mean ultimately nothing less than better *things,* better goods, better articles, better services? Not one of which can come into existence except through the determination, on the part of those who create them, to *make* them better. Is it not obvious that we can never talk, legislate, or police these *things* into being? . . . If we are to have a better house, somebody will have to be a better builder . . . What, then, is the outlook if, along with the portentous increases in the 'bills' that promise us these better things, there be a decrease in the better builders . . . ? What if fifty million of them are being underfed, and twelve million have just been slaughtered, and in one country alone two million are out of work. The outlook is that we shall be disappointed as continually we are. We cry out for more houses, for example, and presently more houses, though not enough of them, begin to appear. But many of them are jerry-built, and made of shoddy material, and will be slums in another thirty years, the whole procured at an enormous cost, which falls ultimately on the very people whose conditions we are trying to improve. Meanwhile, where are the better builders? They are not forthcoming and all we can think of, to take their place, is a better 'bill'! 'No, my long-eared friends' —Mr. Jacks here imagines Carlyle to be speaking— 'improved conditions are not to be had in that way—enchanted multitude that you are! That way lies the road to the bottomless pit.'

"It is one of the marks of a civilization whose faith has drifted in one direction and whose works in another, till culture and labor have lost their natural relationship, that 'more' and 'better' are taken to mean the same thing. By this fatal confusion the 'better' is ruined, the 'more' gradually converted into the 'worse,' like a depreciated currency, and we draw nearer to the bottomless pit, escorted by 'bills.' . . . .

"By way of summing up we invite the critical reader to ponder the following connected propositions, and to accept or reject them according to his experience and judgment.

"1. That the present march of events is being determined, in the main, not by what anybody is *saying,* either in religious, ethical or political language, but by *the momentum of deeply rooted habits,* of which the acquisitive habit, with its attendant, the war-making habit (greatly strengthened by the recent war), is the chief.

"2. That, in spite of the ever-growing importance attached by civilized nations to political operations, the collective fortunes of civilization were never less under the control of political operators, less governed by them, nor drifting more darkly to unknown issues.

"3. That the currents of the world's history have so multiplied in number, increased in complexity, and grown in volume and violence that statesmanship, even the most powerful, is completely outwitted in the effort to bring them under any kind of unitary control; and that, far from governing them by talk, it is not governing them at all.

"4. That the majority of mankind, especially in democratic nations, are unaware of these things; and that, in consequence, they continue to expect from their governments a degree of security and tranquillity which no government can possibly give them in such an imbroglio; continually changing their government for that purpose and always being disappointed.

"5. That one of the chief causes responsible for this blindness is the habit, which all writers and orators have a vested interest in maintaining, of attaching more importance to what is *said* by speaking persons than to what is *done* by working persons; the belief, namely, that by a sufficient incantation of religious, ethical, and political phraseology, civilization will ultimately be diverted from acquisitiveness and war-making and led into better ways.

"6. That the bad custom has become established of testing the value of ideas—religious, ethical, and political —by the degree in which they lend themselves to oratory, and by the amount of eloquent argumentation they prompt, and produce; while the good custom has declined of testing the ideas by the excellence of the workmanship to which they lead on, in spheres of activity other than those dependent upon the tongue.

"7. That in science, where the interests of the orator are least in the ascendant, the standard of truth is higher than in other spheres where eloquence is cultivated and talk made much of; and that science, in consequence, as judged by its 'work,' is just now making a better record than either religion, philosophy, or politics.

"8. That the step from Truth to Beauty, which was almost instantaneous with the Greeks, is being rendered increasingly difficult to the modern world by the bad social habit aforesaid of honoring fine speech in public above good workmanship in private.

"9. That the renascence of poetry and the other arts, as well as of good government, is likelier to arise from the less vociferous of man's pursuits than from the more.

"10. That our actual state is not that of being *governed* but rather that of being *hypnotized* by talk; and that this is what Carlyle had in mind when he described his age as 'enchanted.'"

Now let us add to this the finest of sayings by Louis H. Sullivan in that marvelous *Autobiography* for which we have to thank THE JOURNAL:

"The great creative art of upbuilding a chosen and stable civilization with its unique culture, implies orderly concentration and organization of man's powers toward this sole end, consciously applied in each and every one of his socially constructive activities in the clear light of his understanding that the actualities of good and

evil are resident in man's choice—and not elsewhere. Thus will arise a new Morale in its might.

"And let it be well understood that such creative energy cannot arise from a welter of pallid abstractions, nor can it thrive within the tyranny of any cut and dried system of economics or politics. It must and will arise out of the heart, to be nurtured in common honesty by the intelligence, *and by that sense of artistry which does not interfere with the growth of a living thing* but encourages it to seek and find its own befitting form. Thus the living idea of man, the free spirit, master of his powers, shall find its form-image in a civilization which shall set forth the highest craftsmanship, the artistry of living joyously in stable equilibrium."

All housing problems will vanish when this one is recognized, and never until it is. FRANCIS SMALL.

Housing and Community Planning

CLARENCE S. STEIN, *Associate Editor*

The New York Puzzle

In 1919 New York City reawakened to the housing problem. Rents began to skyrocket. Landlords no longer bargained. Though the roof leaked, the plaster fell, the plumbing balked, the fire escape rusted, the public halls grew filthy, landlords refused repairs. They had the whip hand. The tenant could take it or leave it. There was nowhere better to move. Families were forced downward. They had no alternative, and so they sullenly slid back into the older, dirtier, darker, more disreputable tenements. All over the city they took boarders. They doubled up with one another.

In 1916 with a normal vacancy of apartments of 5%, a tenant could bargain. The landlord took an interest in his welfare. But with the vacancy figures at 36 hundredths of a per cent in 1920, the alternative was to accept what was offered or move into the street.

It was apparent that the far-famed law of supply and demand—even for the lucky half of the population not habitually dwelling in the slums—was not working. The state stepped in. It declared an emergency. The legislature passed laws to protect the tenants who were unable to protect themselves. The laws were simple. They prevented the eviction of tenants except in a few unusual cases and limited the landlord to the exaction of a reasonable rent. When landlord and tenant cannot now agree, the courts fix the rent to be paid.

The legislature also permitted tax exemption for new dwellings with the idea of accelerating house construction.

Some four years have passed. Houses and apartments have been built, particularly during the last two years, in vast numbers, and yet conditions have not improved. The New York State Commission of Housing and Regional Planning, after a careful investigation and numerous public hearings, reported to the Governor and the legislature on the first of the present year, as follows:

"In New York City the housing emergency still exists. In spite of the large number of dwellings constructed during the past two years, tenants are in no better position today than they were in 1920 to bargain with landlords. Rents have risen continuously, and congestion has increased. Families are being forced into poorer and smaller quarters. They are obliged to double up, two families living in rooms which under normal conditions would be occupied by one family; they are increasingly forced to take in lodgers. The dilapidated, insanitary old houses which were considered uninhabitable in 1920 are now fully occupied and over-crowded. The condition of upkeep and repair has grown steadily worse. If the emergency rent laws were needed in 1920 they are even more necessary at the present time."

The Commission also says: "While it is perfectly apparent that the rent laws must be continued for the protection of tenants, particularly tenants in the lower income groups, it is equally apparent that the rent laws will not serve to bring the housing emergency to an end."

The Commission is not blind to the fact that the housing dilemma that has so aroused New York and the rest of the world is not a phenomenon, distinct and separate from conditions characteristic of a so-called normal period. The housing problem that we have all talked so much about since 1919 was not caused—it was merely accentuated—by the war. Its roots go deep into the past. Here—as in Europe—we have had our housing problem ever since the beginning of the industrial age. It is true that in the days before men crowded to the cities to mind the machines, dwellings were often but poor shacks of one or two rooms, without gas, electricity, running water or any of the facilities of the modern bathroom. But those dwellings stood in the open and the free air and sunshine performed their eternal functions of purification. Danger from fire was slight and was a danger to the individual alone and not to a whole community. And so we say that the housing problem began with the industrial revolution—so-called—and that it has grown with the growth of our cities. The standard that the public has required for its own protection has gradually risen. The ability of the individual to pay for that standard has diminished. Thus there has steadily grown up this divergence—this ominous parting of the ways—between the standard of house set by the community—the adequate house—and the inadequate incomes of those that cannot dwell in that house.

Ah! there is the definition of the housing problem—how to make inadequate incomes pay for adequate houses. It sounds more like a puzzle than a problem. But this is what the public of New York is demanding. They are outraged by conditions. They can no longer afford to live decently in an adequate house. They are forced to put up with worn-out quarters far below the standard fixed by law for new construction and sanctioned by the community as minimum standards. Normally this

is true of almost half the population of New York City.

When, on account of the war, the supply of houses fell so far behind the demand that a much larger part of the population was involved in the housing problem—as the poor always have been involved—they, too, suffered from the growing discrepancy between incomes and the cost of houses. The poor has become accustomed to its lot. They have borne it in silence. It was when the articulate classes felt the pinch and found their incomes inadequate for their idea of adequate houses that the volume of complaint rose far above a murmur. It became a howl.

The impossibility of most New Yorkers to pay for a decent home is brought out clearly by the studies of the Commission. Its analysis of incomes in New York State and City shows that of the million and a quarter families in the city, not quite a fourth have between $2,500 and $5,000 a year, and less than a tenth have above $5,000. The average income for the rest of the state is even lower. In fact, only one-quarter of the families within the state have more than $2,500 a year. These, be it remembered, are the incomes of the family, including what is turned in by all the members of it!

Here, then, are the inadequate incomes. What kind of a home can be bought or rented by the vast two-thirds below the $2,500 line? Adequate home! Let us roughly set a standard at least as to number of rooms. An average family, the statisticians say, consists of 4.4 members. Let us get rid of the fractional member and we have 4. There should be at least one common room—even though it be no more than a cramped kitchen—and a bedroom for the parents—and one for each of the children if they be boy and girl. Four rooms! That seems a minimum of decency, does it not?

What does it cost to rent a new four-room apartment? In Manhattan or the Bronx they have built vast quantities of new apartments during the past two years. Most of them are renting for $20 or more a room per month—$80 for a four-room apartment. Now they say that a man spends "one week's wage for one month's rental." This refers to the earnings of the main support, the chief prop, and not to the family income, which was found to be, on the average, one-fourth more than that of the chief earner. But past budget studies and the studies of some 4,000 families made during the last few months by the Commission, show a great variation in the different income groups as between incomes and rentals. The lower groups spend a much larger part of their earnings—28% for those with incomes under $1,000—and only 15% for those above $2,500. All above the $2,000 line spend less than one-fifth of their incomes for rent—and this is checked by other similar studies—so it is safe to say that 20% of income is the possible expenditure for rent.

Let us then return to the 4-room, $80 a month, $960 a year apartment. That means a $4,000 income. One-fifth of the families in New York City can make it without skimping their budget for food, clothing, and some incidental reason for being alive. The rest will have to look elsewhere.

One really low-rental tenement was erected on the island of Manhattan during the last few years. It was built by the Phelps-Stokes Foundation on a limited dividend basis, the rooms to rent at $9 a room, $36 a month for a cramped four-room apartment. It was built on what is called cheap land in Manhattan, but even so it was impossible to make it pay even the limited dividend. Announcement has been made that the rents will have to be raised about one-fourth in order to secure a 6% return on the equity. That means $45 a month, $540 a year. Still too much for two-thirds of the population!

In Queens there is the now famous Metropolitan apartment—the much heralded apartments—where at last we are really to have rooms for $9 a month. Little rooms—but at the low rental of $9. That means a 4-room apartment, with the additional dining alcove—calculated as a half a room—for just a little under $500 a year—$484 to be exact. Here is a chance for a few of the lucky two-thirds! Here those with the fat pay envelopes may squeeze themselves into four rooms. But there are comparatively few of these Metropolitan apartments and already there is a long waiting list.

But what of the thousands of new single family houses that have been built in Brooklyn and Queens? They are mostly priced at $8,000 or $9,000. Way out toward Long Island little rows of these ugly, shoddy, badly built wooden structures are rising and being sold as fast as they are constructed, with the land, for $4,750. They will cost much above the $500 a year that the $2,500 income man can afford to pay in interest, to say nothing of taxes, coal and upkeep. They now promise even cheaper houses—cheaper in every way—to cost $4,000. Even these will be beyond the means of all but the fortunate few in the vast two-thirds of New York's millions.

So this, at last, is the reason why all the vast construction of dwelling places seems to have been of so little help. Incomes are not enough. Which is why so large a part of the population is cramped in inadequate homes—inadequate in size—inadequate in every way. It just can't be done. An inadequate income will not pay for an adequate home.

Some of our hopeful reformers say that if we build enough $20 a room apartments, there will be an oversupply, and then they will be rented at less and so down the scale. Maybe that time will come—we have long been waiting for it. Maybe the time will come when reductions will work all the way down to meet the income scale of families in the littlest, dirtiest, darkest slums. Some of these families have been waiting half a century or so. Does any end to their waiting really seem in sight? With them now is also waiting a large majority of the families of New York—waiting for the famous old law to work its magic—a magic that has never yet worked anywhere.

CLARENCE S. STEIN.

From Our Book Shelf

In the Mirror Darkly

Mrs. Wood's last study of Housing[1] covers a much smaller field than her earlier work on "The Housing of the Unskilled Wage-earner"; for she confines her present

[1] Housing Progress in Western Europe. Edith Elmer Wood.

study to Great Britain, France, Belgium, the Netherlands, and Italy; but her work has gained much in clarity of organization, and the present volume brings together, in acceptable form, a large mass of information which is now scattered under a dozen names, through the files of the architectural and housing journals. Mrs. Wood has visited the countries about which she writes, and her account of housing progress mingles the rubble of personal observation with a reinforcement of statistics. With each chapter goes a retrospect of housing legislation for the country under consideration, a discussion of the various agencies that have arisen to take care of difficulties in housing, and a survey of present activities.

With the general story, most students of housing are already familiar; it begins with the discovery of the slums in the middle of the nineteenth century, it follows the rise of philanthropic associations, building loan and construction societies, and such elaborations of private initiative as the garden city. Slowly it becomes apparent that the work of these associations is insufficient in scope and means; and step by step the state intervenes to establish housing regulations for all classes of building, and to make credit available at low rates for the housing of the workers. The details of housing activity in the various countries of Europe are infinitely diverse; but the general line of development is remarkably the same. It is not that one agent drops out and is supplanted by another; rather, each new enterprise, each new law, adds to the volume of housing effort—and still it proves insufficient, for private enterprise steadily finds domestic building unprofitable and drifts off into other fields. The war awakened many people to this situation, as it appears to have awakened Mrs. Wood, and at the end of the war England and the Netherlands passed housing laws which committed their governments to heavy subsidies. As a result, thousands of houses were built, hundreds of suburban extensions were made, and the standards of both the single houses and the whole community rose perceptibly above the old level of the jerry-builder and the by-law street; of these facts there is no doubt. Nor is there any doubt that to the extent that we have obsequiously waited for the private speculator to build houses which even a private philanthropist could not offer without a sacrifice of his inevitable six per cent, we in America have sunk further into the hole. While one may share Mrs. Wood's enthusiasm for foreign examples, and her impatience for America to catch up with the procession, one question will not efface itself from the mind: What prospect is there under the price system of ever catching up with the demand for decent housing? Government subsidies will relieve the shoe a little where it pinches, and for as long as the taxpayers do not discover that it is they who must pay the subsidy; or, as soon as the cry of active distress dies down, or as soon as some mossy pretext for inactivity presents itself, the subsidy is at once withdrawn, as we have seen it withdrawn in Great Britain. Is one not driven reluctantly to the conclusion that any effort to replace our obsolete and degraded domestic plant and equipment, on a scale broad enough to include the whole community, would also be on terms which would eliminate the price system and do away with land-monopoly? Plainly, the present economic system, on its own confession, cannot produce houses for the whole community at a profit. If this is true, the only task for those who see the housing problem as a whole is to ask: Under what system *can* houses be produced? Our present solutions are, it seems to me, all concerned to deny one staring, palpable fact.

L. M.

The Puzzle in England

Given the rather desperate situation which confronts England with respect to housing and a Liberal viewpoint and it follows that Mr. Barnes's volume[1] must be rated as an exceedingly neat piece of work. So far as the reviewer is aware, no other work on housing compares with it in point of what it offers as a source of information covering the intimately relevant facts. It contains a vast amount of data, unusually well classified and collated, bearing upon housing conditions in England since 1800. Much of this information is presented by graphs which reveal clearly the running relationship over the latter part of this period, in particular, of such significant items as the annual net increases in the number of houses, the course of wages, the cost of articles entering into the family budget, the interest return on consols, etc., etc. There are also many unusually interesting tables covering conditions in the building trade. The number of men engaged in the building industry by decades; the number of houses being built; the numbers engaged in various trades, and in building; the ratio of skilled and unskilled in the building trades; the output of houses per building trades workman at different periods. All this is presented with full notes and documentation. But lest one gain at the outset an impression that the author is solely concerned with statistical data it may be said that the bulk of it is placed in an appendix which occupies one-half of the 500 pages which make up the volume, which contains a short bibliography and an excellent index.

The title suggests the scope and the author's procedure. From the facts contained in the appendix the author traces the course of events from 1800 to date, drawing conclusions in the course of his argument which are brought to a head in the introduction. Of the century and a quarter, the author says:

"The housing shortage of today is not something that comes like a bolt from the blue, that like Melchizedek has no parentage, but is rather the slow accumulation of a century, suddenly and terribly increased by the conditions rising out of the war. . . . Looking back over it all it would appear that the conditions in the latter half-century were not dissimilar from those that obtained in the boom after the recent war. There was a great outburst of industrial and commercial activity playing a triple part, first attracting men from the building industry to other industries, then employing the greater portion of those left in the industry on the erection of industrial and commercial buildings, and lastly, forcing up the cost of building so as to make house building less and less possible as a speculation."

1 HOUSING, THE FACTS AND THE FUTURE, by Harry Barnes, Vice-President of the Royal Institute of British Architects; Fellow of the Surveyors' Institute; Member of the Society of Architects; Member of the Town Planning Institute; Honours Medallist in Building Construction; Chairman of the Housing Committee of the Independent Liberal Party in the House of Commons, 1918-1922, etc.

Under the chapter, "The Surplus Family" (family not provided with its distinct group of rooms), we find a question and answer that must arrest attention.

"What has been the result of 110 years of housing? This: that the army of 320,000 families in 1801 has grown to an army of 860,000 families in 1911, and the persons involved from 1,500,000 in 1801 to 3,900,000 in 1911. Nearly 4,000,000 people without a home after a century of housing. Hardly less than the population of the administrative County of London, greater than the population of Glasgow, Liverpool, Manchester, and Cardiff put together."

Several chapters are given over to an exhaustive study of the decade 1911-1921 with a view of estimating the magnitude of the work ahead. The problem of "Empties and Replacements" is considered and we are brought abreast of the problem.

"We have to estimate how many houses we should build. We begin with the conclusion that we should replace 300,000 old houses. If we are not to add to the number of surplus families how many new dwellings must we provide? How many new families will there be? We start with a population in England and Wales of 37,885,242. This, at the marriage rate of 8 per cent, should give us 3,030,000 marriages, which, at the family rate of 32 per cent, would give us a net increase of 970,000 families, for whom 970,000 new dwellings will be required. With replacements this makes for England and Wales alone a total of 1,270,000 new dwellings required. To this must be added the needs of Scotland, and if we take these as being one-ninth of those in England and Wales we must add 140,000 dwellings to our number, making a total in all of over 1,400,000 dwellings required if this decade is to hold its own and make a beginning on the work of replacement.

"It may be said that we must postpone any real programme of replacements for another decade. It may be so, but if so, the work of the next decade will be cyclopean. Taking this view, however, we have in round figures still to build in Great Britain during this decade 1,000,000 new houses before we can recover an inch of ground on either pre-war or war arrears. Can we do this? That is the question that remains to be answered. But before we can answer it we must consider the extent and character of our building resources."

The resources of the building industry are critically examined, some startling facts are brought to light concerning the growing magnitude of repair and maintenance, the number of building trades workmen involved, the added number required to meet the demands of the present decade. All of which brings the author to the inevitable conclusion:

". . . that even if only accepting past standards, only maintaining as we maintained before, only accumulating dwelling houses and other premises at the average rate of the century that has gone, we shall require the addition of nearly 300,000 men to the building industry. . . . Can a decade which starts its career with 700,000 men complete a task which requires a million? There seems to be only one answer, and that an answer in the negative."

Under "The Augmentation of the Building Industry" is told what is being done to increase the number of apprentices. But the conclusion is not optimistic on this score. So also appear the various efforts to increase production by "dilution."

"So ended the efforts to augment the building industry by dilution so as to meet the emergency demand of the Housing Program. This two-fold record of the abortive efforts at apprenticeship and dilution goes far to show that the problem before those who desire to secure an adequate supply of skilled labor in the building industry in order to effectively cope with an adequate Housing Program is one the solution of which will be extremely difficult."

"Trusts and Rings" come under analysis in a chapter which concludes:

"It is obvious that a plentiful supply of cheap building material is not yet in sight, and that without it the danger of inflated costs arising in the prosecution of any vigorous building enterprise is very real."

Thus far the inquiry has been primarily concerned with an analysis of the material facts involved. It now turns aside to deal with the pecuniary facts and factors. "Actual Costs and Economic Rents," "Factors in Rents," "Earnings in Rent," "The Rent Restriction Acts." In these chapters the examination proceeds along the accustomed paths of non-evolutionary economic analysis. It is brought out clearly that

"It may be taken as absolutely certain that for a considerable percentage of the working-class families of this country private enterprise has never in the past provided new housing accommodations. . . . It may be asked, how then were they provided for? And the answer in the majority of cases, apart from agricultural laborers and miners, is either by the sub-division of existing dwellings, or through the deterioration of such dwellings having the effect of lowering their capital value, the lower rent required on the lower capital value bringing them within the rental power of the lower-waged working classes. . . . New houses they never had. Second, third, fourth, and fifth-hand houses they got, each class declining until they reached the rookery and the slum. One does not begin to understand the housing question until this fact is grasped. . . . Nowhere is there any indication of rising wages, everywhere the indication of a fall. The coolest and most dispassionate view leads to the irresistible conclusion that the percentage of families who are unable to pay an economic rent for the standard of housing demanded for them has increased from the estimate of 13 per cent before the war to at least 25 per cent at the present time. . . . There is, of course, an alternative to the provision of houses for those who cannot pay an economic rent, and that is the augmentation of their income to the extent necessary to enable them to do it. It may be that a minimum wage in all industries will at length be established of sufficient amount to provide the margin required for an economic rent, but such a possibility appears remote and its discussion would lead us far. Another proposal is for some kind of family endowment which would raise the 'family' income to the required level. This proposal whenever seriously pressed is bound to lead to wide controversy with the Trade Union movement, beside opening up a range of possibilities in social organization that is perhaps not fully realized by those who advocate it."

A chapter on "Private Enterprise" deals with the conditions which must obtain if the requisite number of

houses are to be provided under the profit incentive. It is a fair examination; but again the author concludes:

"Can anyone survey the situation as it exists today and find in it any suggestion that private enterprise will be so stimulated in this decade as to undertake the repair of the decade that has gone, much less the wastage of the century before? The writer cannot find it, and so gets back to where he began—to the conclusion that, if this human need is to be satisfactorily met in the lower sections of society, public effort will have to make good the deficiency of private enterprise, not a temporary deficiency, but a continuing and it may be an increasing one."

The chapters which follow, dealing with "Land," "Material," "Labor" and "Finance," cannot be adequately covered in a review. So the author's conclusion as presented in the Introduction must serve to suggest the nature of the argument under these heads.

"The main conclusion is that housing of the working classes has now definitely passed into the same political category as that of their education, and of the provision made for them in old age, sickness and unemployment. As was the case in respect of all these last-named collective provisions for human need, the housing of the working classes is a task which that unregulated individual effort which is called 'private enterprise' has failed adequately to perform in the past, and cannot hope to even as inadequately perform in the future. . . . This conclusion is come to with hesitation and with reluctance, and was avoided till at last a full and dispassionate survey of the data available made it inevitable. The writer has no desire to narrow the field of private and widen that of State enterprise; the reverse is the fact. On the other hand, he cannot refuse to accept the proposition that if private enterprise is proved to have failed, to have made an adequate provision for legitimate human need, their satisfaction must be sought by publicly controlled and regulated effort. . . . The second conclusion is that without the most vigorous, organized, and continuous effort the housing position at the end of the present decade will be worse than it was in 1921. . . . The writer ends as he began, with the assertion that housing is a political question."

As was remarked at the outset, given the Liberal point of view, the author has done a neat piece of work. The Conservative may view such a handling of the facts as the casting of a straw, but he may grasp it. The Socialist may take comfort in the conclusions. But with respect to this the author says:

"To the Socialist it may be said that his rejoicing is premature, for the method least calculated to bring a society based on private enterprise to an end, is that method which removes ills that arise under it."

Although the author gathers his arguments into a firm conclusion, it is clear enough that in the course of his work he has been puzzled over the handling of the facts which stand so securely to deny the doctrine of individual initiative. The facts are not to be denied; and the doctrine of individual initiative is not to be abandoned; so reluctantly he turns the industrial processes of building houses over to politics, which, in view of what politicians have done to Europe during this interval of time, is hardly to be rated a promising programme.

But there is something far more serious to be said in criticism of his fact-gathering process and his handling of the facts gathered. There are numerous omissions among the causal circumstances examined. In covering the course of events over the past centuries, no adequate account is given of the growth of credit. Credit economy is referred to but apparently the author does not view this institution as a factor of first importance. Something to the same effect may be said of the moves within the world of finance and the rapidly developing institution of living by owning. Time and again the inquiry approaches the functions of these institutional factors but they are not brought into the case as prime movers. Time and again the inquiry approaches the outstanding characteristics of the modern order of industry; and it is indicated that the common welfare now hangs upon an adequate rate of profit for the owners of the community's industrial plant and equipment, rather than upon the industrial sufficiency of the community, as once was the case. But the inquiry always passes on and so fails to include among the causal factors, which make for the accruing shortage, what may conceivably be rated as the most important of all, namely, the absentee ownership of the community's industrial plant and equipment.

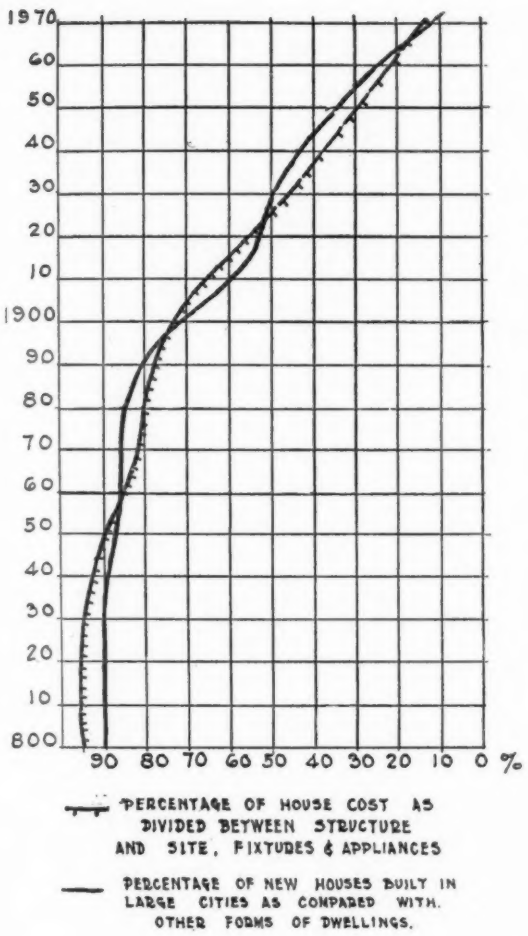
FREDERICK L. ACKERMAN.

Housing in Russia

Under date of 19 January, the Department of Commerce issued a bulletin which points out that 98 per cent of permits for new dwellings in Russia in 1922 were for homes without stairs.

Present building construction in Soviet Russia, says the Bulletin, according to data compiled by the Commissariat of the Interior from building permits issued by 271 municipalities, and abstracted from *Economic Life* by the Eastern European Division of the Department of Commerce, is altogether of a primitive type. The total number of permits issued in 1922 called for the construction of 8,914 private dwellings, of which two-story houses of brick or masonry represented 1.4 per cent, the balance of 98.6 per cent of the permits covering one-story houses of wood and other semi-permanent materials. No permits were issued for buildings over two stories in height. Small houses of simple construction predominated in large cities and small towns irrespective of their size, the difference appearing only in the proportion of two-story houses built of masonry; while in cities with a population of 50,000 to 100,000 the ratio of such buildings amounted to 4.2 per cent; in cities with a population above 100,000 it is represented by 1.3 per cent.

All new home construction is being undertaken exclusively by the owners themselves, not by investors. The simple, "home industry" method of construction is better suited to conditions in smaller towns than in large cities, because carpenters and other workmen insist upon payment in kind instead of in constantly depreciating Soviet paper currency, which condition is easier met in smaller towns; further, inhabitants of small towns are generally more handy at plain building construction, and building materials in such localities are cheaper or obtained clandestinely from State forests.



Housing Progress

This significant graph by Mr. Henry Wright should be read in connection with the text and cartoon printed in the January number of THE JOURNAL. It puts in quantitative form the ratio of housing equipment to municipal improvement or "public utilities"; and it suggests quite definitely that the cost factors in housing are conditioned by elements that lie pretty far outside the province of the individual builder or architect. Comparing the curve of increasing site costs with the diagram that indicates the proportion of houses and multiple-family dwellings built in the larger cities, one suspects that relative extravagance in one direction has been counterbalanced by relative economy in the other; so that, even for the better type of housing, the single family unit tends to disappear under our present methods of city development. So long as our cities and suburbs are so depressing that vast sums of money must be spent on providing roads that lead out of them—and all that goes with this—so long, it seems, will the burden of housing increase even for those groups in the community that are able to make an effective economic demand. There is no reason to emphasize here, however, all the various paths of thought to which Mr. Wright's graph and statistics point. L. M.

The Gothenburg Catalogue

Attention is directed to the Catalogue in English issued by the authorities of the Gothenburg Exposition of 1923. It will shortly be reviewed in our columns but in the meantime members are advised that copies may be had for two dollars.

In our next issue we hope to review Mr. S. D. Adshead's new work on Town Planning, copies of which are now obtainable through the JOURNAL'S Book Shop.

London Letter

The year 1924 is to witness the inauguration of the British Empire Exhibition at Wembley, an exhibition which is comparable in scale if not in scope to the famous display of 1851, to which, however, contributions were sent not only from the Empire Colonies and Dominions but from all over the world.

The Exhibition of 1851 witnessed the triumph of the Victorian conservatory *in excelsis,* for its nucleus was the famous Crystal Palace, afterwards removed to Sydenham where it stands today. It was the work of Paxton, famous as a designer of glass houses, and was selected by Albert the Good in competition from amongst 230 odd rival schemes. Today the Crystal Palace remains a remarkable and imaginative conception, its height combining with the elevation of its site to produce a landmark visible for miles around.

Time and architectural taste have changed since 1851, and the Wembley buildings will provide a remarkable opportunity for their architects to prove their mettle, it is unfortunate, however, that the number of architects employed will be considerably restricted, as the design of the greater part of the main scheme is apparently in the hands of one firm, and the buildings will therefore hardly be representative of the present trend of English architecture.

It is early yet to form a judgment, though work on the exhibition is advancing rapidly and some of the buildings on the main avenue are on a fair way to completion. Such designs, however, as have been published are frankly a little disappointing, and awake familiar reminiscence of the classic revival. There is as yet nothing to indicate the promise of a real contribution towards an expression of the age in which we live; nothing as fine in its ordered dignity as the Chicago "World's Fair,"

as appealing in its charm of handling as San Diego, nor as vivid in its freshness of outlook as last year's Gothenburg Exhibition.

There are architects in the Empire who have the ability and power to express ideas, to examine the realization of which it would be worth while crossing the Atlantic Ocean. Whether they will be given an opportunity on any scale at Wembley is not yet clear; if not it will be a lasting reproach to the authorities responsible and to those whose counsel will have resulted in housing the Empire's finest exhibits in buildings which are not truly representative of the Empire's finest architects.

* * *

At Wembley will be held a public Exhibition organized by the Architecture Club, that increasingly active and influential group of architects and writers which seems to have largely taken over from the professional societies the task of promoting closer relationship between architect and public. At a dinner held in November at the Hotel Cecil there was a larger attendance of prominent members and guests than ever before, but the quality of the speeches was not equally rich and distinguished. Lord Riddell spoke on the well-worn theme of the importance of the architect being a real business man; Mr. Paul Waterhouse, P.P.R.I.B.A., talked amusingly down to the level of a comfortably fed audience, and Mr. Edmund Gosse created a slightly emotional atmosphere of respect for the beauties of the past and regret of modern ruthlessness. Nobody, however, ventured on such themes as that of indicating the lines along which effort might be directed towards the production of a better modern architecture nor was much said which might be considered of real import. One felt that such a meeting, always widely reported, might with advantage discard a little of the after-dinner attitude in favor of stimulating thought on any of the numerous important issues which affect the profession, and through the architect, the general public.

* * *

Mr. Alfred Gotch, P.R.I.B.A., a President enjoying the general esteem of the profession, has formally entered upon his year of office, and the occasion of his inaugural address was also one of farewell to the Past President, Mr. Paul Waterhouse. Every retiring President of the Royal Institute finds his portrait added to the imposing gallery of pictures which forms an interesting record of types of personalities and painting; the latest portrait is therefore that of Mr. Paul Waterhouse, fittingly immortalized by Sir William Orpen. Does the American Institute still follow this custom?

The past Presidents are men who, unlike the prophets, are honored in their own country, but it will be interesting to see whether twentieth century conditions will also produce the type of man who will be equally honored by the nation at large, such men as those whose records entitle them to repose in England's Pantheon, Westminster Abbey. Street, Sir Gilbert Scott, and Sir Charles Barry have their tombs in the North Aisle, close to those of Robert Stephenson, Ben Johnson and Livingstone, and there is still room in this corner of talent. But perhaps nowadays fair achievement is too general to enable one man in his life-time to climb far above the heads of his fellow artists.

* * *

The assessing of Public Competitions continues to be a sore spot on the architectural epidermis. Two recent important competitions have called forth pointed comment from some of the competitors, the first being a limited competition for sets of Chambers at King's College, Cambridge, facing a spacious lawn stretching away towards Clare College, and forming a block at right angles to Gibb's famous building of King's.

In this case there was a single architect assessor, who apparently advised a committee of laymen as regards the plans and technical points. The premiated design had certain defects, but a main point of dissatisfaction was its alleged violation of the conditions in not providing the full accommodation asked for.

The second competition in question was that for a new Art Gallery for Hull in which the premiated design was particularly disappointing in its failure to attempt any solution to the problem of the present defective system of toplighted galleries, in spite of the fact that the programme laid particular stress on effective lighting as the principal requirement.

Such criticism by competitors will certainly continue to be levelled as long as architects feel that the system of the single assessor may fail to reward the best designs. Many architects of experience feel the necessity for a Jury on which the promoters will have reasonable representation, on the theory that those who pay the piper should have something to say about the tune.

* * *

Next year will witness an increase in the number of publications dealing with architecture. A whole series of new books will treat of famous cities, somewhat in the manner of the French series of "Les villes d'art célèbres," and monographs on famous architects will include the names of Bentley, Chambers, Vanbrugh, Inigo Jones and Hawksmoor. In the meantime the architect is maintaining his modest place as a character in fiction, following the lead given by Galsworthy and Arnold Bennett in the "Man of Property" and the "Roll Call."

This time it is Mr. Aldous Huxley who, in "Antic Hay," touches lightly on the dreams and disappointments of the profession. His architect honors the book by remaining the most unsullied person in it, and in addition is thoroughly characteristic with his model of Wren's plan for London and some pungent criticism of the new Regent Street. "There are some streets . . . senseless discords and a horrible disorder all the way. And the one street that was really like a symphony by Mozart —how busily and gleefully they're pulling it down now! Another year and there'll be nothing left of Regent Street. There'll only be a jumble of huge, hideous buildings at three-quarters of a million apiece. A concert of Brobdingnagian cats. Order has been turned into disgusting chaos. We need no barbarians from outside; they're on the premises, all the time." One has an uneasy feeling with Mr. Aldous Huxley that this is not far from the truth.

"X."

January, 1924.

The Secretary's Page

17. FAIR PLAY. We are all of us interested in the matter of fair play as between the architect and the client. I think you will all agree with me that fair play on both sides will usually result in satisfied participants in any building endeavor. Usually we find either party trying to explain what the other party must do to give it what it considers fair play. Very rarely do we find a party trying to explain what it must do to give the other party fair play. To my mind this latter thing is what the architect ought to be doing right now.

18. AN EXAMPLE. There recently came to my desk a little pamphlet, entitled, "Lutheran Church Art," Vol. 2, No. 3, printed in Cleveland, Ohio, November, 1923. It states that it is "Printed from Time to Time in the Interest of Better Lutheran Architecture, Music, Liturgics, Paramentics, and Kindred Subjects." This particular number devoted nearly half its space to the subject of architecture and architects. As I read it, not being familiar with the little pamphlet, I wondered who and how and why and so forth. It was worth studying. Then I found that it was being published by the Rev. F. R. Webber, 13706 Glenside Road, N. E., Cleveland, Ohio, and that he is trying to broadcast through the Lutheran churches the general doctrine I have quoted. In the number to which I refer there was published an article entitled:

18-a. "BEATING THE ARCHITECT." Now as this article was printed in full in the January issue of THE JOURNAL, it only remains for me to give all possible emphasis to it, and then to inquire—

19. WHAT CAN THE ARCHITECT SAY? It makes it a bit embarrassing, doesn't it? There isn't any indication that the architect might have been at fault. I feel almost ashamed to call attention to such a wonderful clear-cut fair plea for proper treatment of the profession without a single thought that there could be anything but fair treatment in return. I regret to say that there has not always been fair play on the part of the profession, for unfortunately the profession does contain a great many men who have no right to the title of architect. The time has come, it seems to me, for the profession of architecture to clean house. Without the direct encouragement of so-called architects the things that are done that are so manifestly unfair could not be done.

20. WHAT CAN THE INSTITUTE DO? The Institute stands for all that is best in the profession. Then let the Institute take up the matter of seeing that each and every member in it gives fair play to the owners. Let each man insist on giving a complete and full service. Let the entire publicity of the Institute show what such a service means. The question of the fee will disappear if the service is given. Most of the troubles arise from a lack of the giving of a good service. Each man that gives an inadequate or poor service simply proves to the owner that there is nothing in architectural service.

Why not let the public know that a sign over the door or an imposing letterhead, or a smug or clever statement doesn't mean that the man in question knows anything about his business? Why not so inform the public as to what an architect should do that they will be able, very quickly, themselves, to know that they are or are not getting the value for their money. Why not talk a lot about ourselves and what we are trying to do and what we should do, just as Mr. Webber has so courageously done, before we talk about others. Why not be perfectly frank not only to ourselves but to the public at large. WHY NOT?

EDWIN H. BROWN, *Secretary.*

Public Buildings

In his Annual Report, Secretary Mellon, in the section devoted to Public Buildings, says the following:

"Because of abnormal conditions resulting from the World War and continued excessive construction costs it has been necessary to postpone the erection of a large number of Federal buildings authorized in the omnibus public building act of March, 1913. In the meantime no additional public buildings have been authorized to be constructed, and as a result many years will be required to provide buildings in communities where they are greatly needed. Prudence would suggest the necessity for a carefully considered public building program, and it is believed that the following recommendation made by one of my predecessors, Secretary Cortelyou, in a report addressed under date of 7 December, 1908, to the Speaker of the House, should receive serious consideration:

" 'Further change, it is believed, could be made to great advantage. The present system employed in connection with bills for public buildings is not conducive to the best results. A great mass of bills is annually poured in on the department with requests for early reports. In many instances the buildings authorized are unnecessary for the public business, and in the interests of economy the construction could be postponed for several years. Insufficient time is allowed for investigation as to the requirements of the buildings proposed, or in fact for an accurate estimate of cost. As a result it frequently happens that a number of buildings are authorized which are not required, and, on the other hand, no appropriations are made for localities in which the Government is urgently in need of adequate buildings, and is in all probability paying large rent for insufficient quarters.

" 'Public building appropriations should be put on a basis similar to that now employed in connection with appropriations for river and harbor work. If this were done the Congress would submit to this department a list of localities with the request that at the next session a report be submitted showing—

" '1. The necessity or advisability of a building in the city or town suggested. This would necessarily embrace the size of the city, the cost of the building, and the price at which rented quarters are to be had.

" '2. If a public building is recommended, the area and

probable cost of the site; the size, cost, and character of the building that should be erected; the branches of the Government service that would occupy it when completed; and the annual cost of its maintenance.

" '3. The amount of appropriation necessary to carry on the work during the ensuing fiscal year.

" 'With such a report, carefully made in detail after consultation with the other departments interested, the Congress would be better able to judge of the advisability of authorizing a building and of the appropriation required. I am confident that by this method a great saving could be effected and that buildings could be more satisfactorily and economically distributed.' "

The Institute will heartily support such a program and it heartily welcomes the opportunity to congratulate Secretary Mellon on his breadth of view. What is yet to be feared is that the urgency of needs throughout the country, in the matter of Federal buildings, will still lead to legislation of the omnibus variety, especially if Congress is asked to sanction the recommendations of the administration for a program for buildings in the city of Washington.

In view of the fact that the Government is now paying 20 millions a year in rent, the report of the Supervising Architect's office might well lead one to go a step further than does Secretary Mellon. It appears that there are fourteen buildings authorized previous to the Act of 1913, and 125 authorized by and subsequent to that Act, which are not yet under construction. Four new buildings only were completed during the fiscal year of 1923. Such a record could not be tolerated in any growing business, and we do not see why the waste needs to continue. A rental charge of twenty millions can be capitalized. Other sums could be saved by larger quarters or increased facilities. The architectural profession throughout the United States has a record such as places it at the very front, technically and esthetically. Business uses this organization and expends billions through its various offices. The government can do the same, with a vast saving to the people, an imposing increase in their comfort and convenience, and a beneficent addition to the architecture of the country. As we have already made clear, we believe that architects should be selected by the government, under proper provisions, and that wherever possible they should be locally chosen and locally inspired to study their problems in the light of local materials, traditions, and customs. Here lies a field that all other governments cultivate assiduously, with profit to all.

At the Federated Engineering meeting held in Washington, 9 January, where there were present approximately one hundred delegates representing some sixty different organizations, all of whom, except the Institute delegates, were identified with engineering and construction interests, the question of the reorganization of the governmental public building activities was discussed at great length. Readers of THE JOURNAL will remember that this movement has long been under way, and culminated generally in the Jones-Reavis bill as it was called, which was introduced into the Senate in 1919. The points of this bill were chiefly the suggested creation of a Department of Public Works, and the gathering together of all the government's public building work thereunder. The Secretary was to be a cabinet officer. The deliberations of the meeting on 9 January resulted in the passage of the following resolution:

WHEREAS, the present structure of the Federal Department represents the unpruned growth of many years and is imperfectly adapted to present needs; and

WHEREAS, definite recommendations have been made by both President Harding and President Coolidge emphasizing the need of a reorganization of public business, and a plan of general reorganization of departments is under consideration by a joint committee of Congress; and

WHEREAS, the engineers and architects and related technical professions of the country have for many years advocated the establishment of a National Department of Public Works in which the matters relating to public works might be administered and co-ordinated, and

WHEREAS, the consideration of recent bills for the creation of a Department of Public Works was suspended in the interest of a general reorganization; and

WHEREAS, this subject has received the careful consideration of this conference representing more than sixty engineering, architectural and related organizations from all sections of the country, and

WHEREAS, the establishment of a Department of Public Works would make it possible to place governmental engineering and architecture on planes reflecting the highest achievements in these proessions, known to the world; and

WHEREAS, a co-ordinated functioning of all public works agencies would be able to stabilize business and employment by expanding public work when private industry and employment may be slack, and by reducing such work as far as practicable when private industry may be fully absorbing the available supply of men and materials; and

WHEREAS, the advance and co-ordinated planning of public works is sound economy in that it permits the government to execute less work at peak prices and more work at the lower prices prevailing during dull times; Be it therefore

Resolved: That this Conference of engineers and architects, and allied interests, heartily approves the movement for a reorganization of Federal Departments, and it particularly endorses grouping and co-ordinating within an existing Department, preferably renamed a Department of Public Works, the construction and administration of all non-military public works. M. B. MEDARY, JR.,

Chairman, Committee on Public Buildings.

Faience

In an address to the members of the Tile Manufacturers' Representatives Club of New York, Mr. A. Vanderlaan, one of the leading authorities on faience in this country, said some very interesting things:

"To a tile and faience manufacturers' representative," said Mr. Vanderlaan, "it is almost superfluous to say that unless a man loves faience, its textures, its colors, its expression and its history, he will never be able to distinguish himself in this field of the arts. He may do well

enough as a tile-salesman; he may be able to know all about its *price,* but he will never know its *value.* And value, not price, is what counts.

"Value of faience lies in its quality, and quality in faience as well as in paintings, books, men or women, is evidenced by the pleasure which one finds in their presence and the desire which they create to have them as steady companions.

"It has been said that graves are silent, but through faience, the graves of antiquity have spoken louder than any other existing records. Wherever in the dim and forgotten pasts, civilizations existed, we have but to dig amongst the ashes of the dead and the long forgotten, and we find vases, urns, rings and tablets of faience bearing indestructible witness to the character of these vanished and sometimes completely obliterated civilizations. From the craftsmanship, shape, color and decorative values of their earthenware, we are able to reconstruct and judge those past cultures. We judge and admire the marvelous Persian, Greek and Egyptian civilizations or we discuss in a spirit of criticism cultures as expressed by the earthenwares of old Etruria. We, our civilization, our culture, will also be judged some day by what we are producing today in that indestructible field of artistic endeavor: *faience.*

"Do we at all times bear in mind the seriousness of this responsibility? Will our great grandchildren stand in awe, and revere the memory of our artistic performance? Will they admire our craftsmanship, our taste, our understanding of what is 'fit and meet'; when for instance they descend into the tunnels which we of today are using for subterraneous transportation? Can there by any doubt in your minds as to the negative appraisal by future generations of our artistic culture as expressed in those diggings? And is the architect to blame? Most decidedly not. He employed the best opinions, the best tools which the keramists of the country saw fit to put at his disposal.

"The student of that future day will recognize that amongst much ruthless commercialism (whereby of course I do not mean the legitimate use of clean and sanitary white wall tile) here and there a conscience, a soul has been born. He will notice interesting, encouraging strides in the right direction.

"A man by the name of Mercer will be given a place of honor as a pioneer in the field of honest Ceramic Art. Alongside of him will be placed Herman C. Mueller of Trenton, N. J., who for American Faience has done what his namesake Francis H. Mueller during the last 25 years of the 18th century did for the development of Copenhagen Faience.

"Considerable credit will be given to the work of Wm. H. Grueby of Boston and H. Dulles Allen of Enfield, Pa., who never sacrificed their art for mere financial gain and who in spite of material sacrifices remained true to the ideals of their profession.

"I touched a moment ago on the appraisal of past cultures and would now ask you to go back about 2500 years, in order to get a glimpse of old Etruria, according to such authorities as Prof. Richard Norton of Bryn Mawr and of Henry Beauchamp Walters of the British Museum. The origin of Etruria is lost in the ages, but from about 1000 years before Christ, Etruria, lying on the East coast of Italy, seems to have been peopled by enterprising traders. Through the Phœnicians, the Etruscans entertained steady intercourse with Greece, Assyria and Egypt.

"The quantity of terra cotta antiquities which have been found in the territory occupied by the Etruscans is vast and the quality of some of the vases is so exceptional that for centuries the Etruscans have passed muster as a people who as ceramic artists and craftsmen were equal to the Greeks themselves.

"Careful study, however, has definitely proven that the best of the earthenware found in Etruria was made in Greece and imported from there. Etrurian ceramic art expressed itself by the Etrurian's understanding and appreciation of the higher art of Greece, which, broad-minded as they were, helped and inspired their artisans to efforts, and obtained results for them far in excess of what they otherwise would have accomplished.

"Reviewing the history of ceramics, we continuously meet with the same cause and the same effect. Up to the twelfth century Italy, after the fall of the Roman Empire, produced only the simplest kind of solidly glazed green, yellow and brown pottery. We read that after that date experiments were made in the town of Faenza with pottery made after the fashion of the Spanish Moors and brought to Italy by ships from the island of Majorca, after which the pottery was named Majelica.

"Mr. Robert L. Hobson, of the Department of Mediæval Antiquities of the British Museum, lays particular stress on the obligation which the Italian Majolists owe to the Spanish Moor whose wares inspired them to such a degree that about the year 1500 lustres were obtained of a tone and quality which has never been surpassed.

"The history of French Faience is the same as the Italian except that it does not begin until 1384, when Spanish artisans were imported to make tiles in the Spanish fashion. Italian wares and artisans were imported as late as 1529 when one of the Della Robbias was invited by the king to come to France to decorate his castle. As a result, *and to the glory of France,* the world famous potteries of Rouen, Nevers and Sevres were inspired and grew up.

"Wherever we see great developments in Faience we see it preceded by liberal policies inspired by true appreciation of the higher art achieved in other countries. There is little doubt that Holland learned the art of making fine faience through the Spanish and Portuguese Jew-refugees, who found asylum in that country after their expulsion by the Inquisition. Later on their art was extended and perfected by the stimulus of Chinese and Japanese potteries. England again was stimulated by the example of Holland. According to the above quoted Mr. Hobson of the British Museum, the great advance and development of the English art does not begin until the Dutch potters settled in Staffordshire in the year 1690.

"In the days of which I spoke, we do not read of combinations or guilds who believed that they had nothing to learn, who vowed that their efforts were good enough

for their country. We do not read of distinctly unpatriotic efforts to retard the technical and artistic development of their country by obstructing in every way the introduction of more highly developed materials. Wherever we look, the opposite has been the case. History is worth noting unless it teaches something. And here indeed a valuable lesson is still to be learned.

Public Information

The Alabama, Colorado, Dayton, Georgia, Michigan, Montana, New York, North Carolina, San Francisco, Scranton, Wilkes-Barre, South Carolina, and Southern Pennsylvania Chapters are being supplied with the articles issued by the Public Information Committee of the Institute. The titles and authors of these articles are "The Schoolhouse Beautiful," William B. Ittner; "Snappy Styles in Housebuilding," Florence E. Haviland; "The Manufacturer Reviews the Architect," Edward H. Putnam; "How We Came to Plan Our City," Thomas Adams; "The Clinic in Architecture," Horace W. Peaslee; "A Little Sermon on the Triangle with Particular Emphasis on the Architectural," George S. Chappell; "Church Architecture," Ralph A. Cram; "Factory Buildings and Good Architecture," Albert Kahn; "Just a Love Nest," Robert Benchley; "Planning the Attractive Town," George B. Ford, and "Plan of Washington," by Charles Moore, and a second article by George Chappell.

The Dayton Chapter has been active in publishing articles in the Dayton *Sunday News*. They have guaranteed to keep the paper supplied with material for at least a year. The newspaper publishes the articles exactly as written and seems to be glad of the opportunity. Now that the start has been made, the members, at first slow to respond, are taking greater interest. This Chapter is beginning the publication of the series of articles furnished by the Public Information Committee of the Institute, having made arrangements for this with the Dayton *Sunday Journal*. Thus they hope to reach the subscribers of both papers. The Chairman of the Chapter's Publicity Committee is Walter G. Shaeffer.

The New York Chapter has made arrangements with a professional press agent. They found that it was difficult to reach the New York press without the assistance of an expert for the preparation of material and for placing it. The fee charged is comparatively small and it is possible that others among the larger Chapters might find it distinctly to their advantage to follow a similar policy.

The Washington, D. C., Chapter has been issuing most interesting weekly articles in the Washington *Post*. Some of the titles are: "Architect Seen Mainspring of Home Beautiful Building," "Architect's Job Outlined," "Readers' Queries Sought," "Expert Discusses Contractors' and Architects' Fees." They appear in the Home Beautiful Section. This activity is due principally to the efforts of Harry F. Cunningham, Secretary of the Chapter.

JOHN V. VAN PELT,
Chairman, Public Information Committee, A.I.A.
126 East 59th St., New York City.

The Esthetic Side of the Engineering Profession

Long ago when Nature set out to design trees on a large scale fundamental rules seem to have been followed. No reduction was permitted in the cross section of a trunk or twig, for instance, except where it branched into two or more members; and the cross section of all branches would exactly equal the cross section of that body from which they branched. Thus did nature care for the distribution of material to obtain proper strength.

As the pilgrims on a new continent, whose first concern was to find food, clothing and shelter, instinctively developed the refinements of architecture as soon as they had satisfied their need for shelter, so Nature seems to have planned in a masterly manner for the esthetic side of her work. She could not allow the elm tree to grow a cylindrical stem up to where the main branches form that Gothic semi-arch; nor would she alter her fundamental rule of design. And the trunk, sending forth twigs and sprays at frequent intervals, effects a gradual tapering of the stem according to her rule, even if these twigs are later to be broken off, and thus we have the pleasing, gradual tapering of the column. This is but an example of how unfailing Nature is in considering the esthetic as well as the structural features of her design.

In the engineering world, the designer is charged with the responsibility of clothing his parallelogram of forces in metal of a strength sufficient to withstand normal and abnormal conditions, but also able to pass economic approval. He may increase his factor of safety in strength until the cost of material jeopardizes his chance in competition; or he may economize on material until he loses his reputation as a designer on the ground of poor judgment in strength. Again, he may attack his problems from a different angle; he may find a new principle of application so that he can clean his slate and work up a simpler design.

Such are the design problems facing the engineer from his school days to the end of his career. His education and training have been calculated to buoy for him a safe course; and if he has been putting his whole heart into his work for a few years he has made progress. Like the plant in the flower garden which at maturity is ready to put forth flowers, so the talented among the engineer-designers are now beginning to appreciate and seek the esthetic aspect of their work. The sooner the engineer-designer reaches maturity in the fundamentals of design the sooner this latent feature begins to blossom forth. Hence it is important that the executive so distribute the duties among the younger and the maturer members of his designing force as to obtain the desired result. A mechanic must know his tools; this applies equally well to the engineer and his designing corps.

It has often been possible, for example, on a visit to the foundry or the casting shed, to identify the work of as many as twenty different designers from the rough machine parts. There can hardly be, in any line of work, a wider opportunity for individual expression than in the world of engineering design.

Has the esthetic side of engineering design been given proper credit? In a new country like ours with the most daring developments daily pushed into being and fruition, esthetics may be expected to lag for a time. Periods of prosperity have kept us too busy for esthetic buds to grow on design, and the frequent business depressions have had a tendency to blast the attempts. This, perhaps, because such results have not been seriously guarded against. Our country, in the forefront of the engineering world, must wake to the importance of this subject or face a just criticism in the comparison with foreign built goods. To fully appreciate this one should have had an opportunity to examine a domestic design, and its foreign likeness where a greater attention has been given to esthetic features. There are more such cases in existence than our engineers realize. But let it never be forgotten that good appearance inspires confidence in the machine, as well as admiration for its builder and designer. Now the engineering world today is in grave danger of losing the *esthetic feature of design,* and this threatening loss may be even more far-reaching in its scope, for that which blasts the buds and blossoms may also dwarf the plant.

During the war industrial production was accelerated by intensive training and shortened terms of learning. Quality was expected to wane except where it affected our combative efficiency. The result today is our daily question: Who has patience and time to learn a thing thoroughly? Unfortunately the engineer of today is gradually becoming more helpless, partly under the drive of specialization. While the drawing is the language of the engineer, he cannot make one, nor supervise the making of it. He can no longer design a piece of machinery, nor even make a good sketch. He may be able to dictate long letters telling a draftsman to make drawings for him; and the draftsman may be ready to draw lines by the yard, circles by the dozen, and projections by the square foot. But *who* is to design the machine or apparatus for this engineer?

The art of engineering design is today in grave danger of losing ground in a widening gulf between engineers and draftsman. Pointing out the danger is but the first and easiest step towards a remedy. Should not the next step be to give credit where credit is due, to recognize the designer as a factor in the engineering world and provide for his training?

EMIL G. BERN.

Portland Cement

1824-1924

Joseph Aspdin, receiving his patent from the British Government in 1824, for a material he elected to call portland cement, no doubt had a vision of great things, for all things in this world begin in a dream. Perhaps he may have felt that the process of building would be completely revolutionized in the decade succeeding the granting of his patent, and if he called his invention by the name of portland, it was because he may have believed that its resemblance to the stone mined at the famous quarries of Portland, so wonderfully described by Hardy in *The Well Beloved,* would help to bring about the revolution.

Certainly the tale of portland cement is like many another and the telling of it is far from over. It is still too early to predict the nature and extent of the changes it has brought, if one looks over the field not as a bookkeeper but as an inquirer. The 135,000,000 barrels of cement that flowed away from the American factories have brought many blessings, undoubtedly, and yet the bald fact stares us in the face that cement costs more than ever, that building costs more than ever, and that we are not likely ever to see any permanent abatement in the upward climb of building costs.

Esthetically we note an improvement. Cement is being more intelligently used and its craftsmen are making some progress away from the unsightliness of the early years. Much remains to be done in this direction, but more still remains to be done in bringing cement to that state of economic usefulness and benefit which alone indicates a true and abiding progress. The problem is not one of the industry itself, but of our whole economic existence—yes, even of our national being. H. C. B.

From Our Book Shelf

Mozarabic

Iglesias Mozárabes[1] is a very well-made book—good paper, beautiful letter-press, excellent arrangement and illustrations. It is a treasury of reference for the period it covers, and possesses more than one sort of interest. It is a close and paintaking inquiry into the Mozarabic character of churches throughout the Peninsula, built during the ninth and tenth centuries. Even a superficial examination of the text shows how diligent and exhaustive the inquiry has been, and how much of enthusiasm supported it; the evidence adduced being most various: the buildings themselves; their types of plan; distinguishing details; peculiarities of construction; everything ascertainable bearing on their history, including manuscripts, inscriptions, codices, church inventories, furniture, as well as tradition, legend and even folk-lore.

Before glancing at what research of this character implies, it may be well to define what is meant by Mozarabic, i.e., pertaining to the people called *Mozárabes.* The author states it thus: "The concept of Mozarabism embraces two phases, that is to say: Christianity subject to the Mussulmans and living together with them, and the emancipated Mussulmans, whether they rise as rebels in their own lands, or emigrate to Christian countries, where they represent the Southern Andalusian influence under diverse aspects. There enter, therefore, into our series, not only the churches properly Mozarabic, but all those of conquered countries, that owe their being to Christians of the South and follow the rules of Gothic art first and of Cordovan later on, in face of the other group of edifices emanating from Northern influence, and that signify, in their turn, the invading penetration of Europe." By Gothic, of course, is meant that which

[1] IGLESIAS MOZÁRABES: ARTE ESPAÑOL DE LOS SIGLOS IX A XI. Por M. Gómez-Moreno.

is of the Goths, who established themselves in Spain long before the advent of the style we commonly denote by that name—in Spanish *godo,* as against *gótico.*

The problem confronting the author was to determine, by the means above noted, the provenance of the buildings in question, an essential factor being the verification of dates. This because he maintains that Mozarabic art is to be circumscribed within the limits of the period 850-1030, the period of the flourishing of the Califate of Cordova, during which there was a cultural advance of the utmost importance, and when, he claims, Spain nationalized herself, as much as was possible. His contention, very broadly summarized, is that the product of this fertile period, carried into the North by the movements of the Southern people, because of political and religious disorders, and meeting there the Visigothic, there grew out of the contact a characteristic national art, and that though, for whatever reason, this failed of its full development, the technical base on which it could have realized itself exists and is revealed by these buildings. The historic ground traversed is an exceedingly complicated terrain—indeed, Spanish history in general is of somewhat baffling complexity—and there is indication of controversial possibilities. To arrive at an opinion of the validity and success of the attributions put forward would involve an acquaintance with the whole subject far more intimate than is possessed by more than very few Americans. There is all the appearance of most scrupulous care in documentation and much look of authority.

No small part of the attraction of these buildings, at least for the Spaniard, lies in the theory that, however rude, they contain the germs of design and structural methods capable of development in a larger and finer way, and expressive of the racial genius. They are by no means lacking in suggestiveness even for us, who gather our motives with so eclectic a net; but although actual beauty exists in a number of instances, the dominant aspect is somewhat primitive for a profession that is not distinguished by fervor for archæological research and is fond of culling ripe fruit.

But to the student of early ecclesiastical architecture, who can discern the latent possibilities offered; who can delight in certain positive charms of composition, as at San Salvador de Valdediós, Santa Cristina de Lena, San Miguel de Escalada, San Cebrián de Mazote, San Millan de la Cogolla; and be rejoiced by details of not unfamiliar type but of a very special virility—to him this is a book to be commended. And if, in addition, he happens to be curious about the Spanish mind, he will be further rewarded.

Within the compass of a few pages there is a rich picture of the currents of civilization that have affected the arts of Spain; there is a luminous account of the relations of Christians and Moslems; there is a catholic perception of the sound way to approach the study of history; there is a bold dismissal, with sweeping gesture, of convenient but misleading historical formulæ, and there is an appeal to the true genius of the race—and a great race it is.

Preoccupation with making history a thing alive—the recognition of Clio as a Muse—manifests itself in many Spanish writers; it was the mainspring of the remarkable series of *Episodios Nacionales* of Pérez-Galdós; it appears in many an essayist and other writers. And, to one reviewer at least, nothing in the realm of literature is more appealing than the desire that for the past quarter-century has inspired so much of Spanish thought—the yearning toward self-realization and the standing firmly upon their own feet. For it is a noble aspiration of an indomitable people. Perhaps no country has undergone such a series of successive waves of outside influence as Spain, had so much imposed upon it. And the marvel is that despite it all, foreign conquest, foreign politics, foreign thought and fashions, foreign arts, the Spaniard has remained as Spanish as his sonorous preterites and florid conditionals. No matter how you prank him out in alien modes you never swamp this African Visigoth.

C. Grant La Farge.

Marginalia Architectura

The origin of Architecture is buried in the obscurity of the gigantic past. What changes have the discoveries of the human mind wrought since the days when our first ancestors covered their simple roofs with thatch! The spirit of unrest is imperious. Havelock Ellis tells us that it is our high privilege to be living in a great Classico-Mathematical Renaissance. In connotation, it may be said that during the last seven or eight lustra we have seen the revival in rapid succession of as many historic styles. The leaders of the architectural profession have not disdained to play the gamut of the great scale, even the clever ones, *"qui Xantho lavis amne crinis"* (Horace is such a help in starting out), footing the Lesbian measure, some trippingly, others with halting strophes in response to the perennial demands for novelty.

Romanesque forms are again revived with considerable pomp and circumstance. As we remember, it was about 1888 that the Romanesque style was in its perihelion. Every architect's office in the United States, with few exceptions, had a pseudo-neo-Romanesque building of some sort on its boards: courthouses, railroad stations, public libraries, state capitols, town and city residences in the style of Theodosius, Dagobert, Chilpéric, Charlemange, and Louis le Debonnair were considered very swank in those days. A few short years saw a violent reaction, and in the buildings of the Columbian Exposition a notable group of architects collaborated in producing the famous Court of Honor. Here the calm majesty of Greece, the glory that was Rome, were set in scenic plaster, covering vast forests of two-by-fours, embellished with countless sculptured deities, dancing fauns, edacious cupidons, miles of eggs and darts, dentils, frets, running bands, interlaces, arabesques, beads and reels, and myriads of anthemia and acroteria. Here was the chance of a lifetime for architects, draughtsmen, sculptors, and painters. An æsthetically starved public looked on with

delight and admiration, as the magical White City took form. Despite some incongruities the finished result was very beautiful. The genius of Charles B. Atwood, a dominant mind and vital personality, whose guiding hand was evident, seemed to correlate the varied schemes into an harmonious whole. The Peristyle and the Art Museum were the most distinguished structures, suited in every way for their purposes, and imposing to a degree.

* * *

The next lustrum might be termed the Period of the Cartouche. History took a big leap and landed in the lap of the Grand Monarque. No building was complete without one or more of these crowning *motifs. "Le style rocaille a abusé des cartouches,"* as the copy-books say. Many buildings of a quarter-century ago bear striking testimony to this wild scramble for faddism. A few examples are cleverly and ingeniously wrought. On the whole, however, the revivalists lacked the imagination of the Mansards (Francois and Jules Hardouin), Claude Perrault, Francois Blondel, André le Nautre, Jacques le Mercier, Louis de Foix, and Philibert de l'Orme. After the period of Louis XIV, we naturally turned to the eminent artists of the eighteenth century, whose work is most closely identified with what is termed the *Style Louis XVI.* This period naturally suggests Jacques François Blondel, concerning whose private life an interesting sidelight is revealed in the Memoirs of Casanova, to which we shall ask permission to allude later. This Louis XVI style has hung on tenaciously and is still going strong, though not with the same ebullient fertility of the decades of '98 to '08. During those years there was a curious interlacing of styles with touches of Spanish influence, here and there, and always a strong tang of the Italian Renaissance. No finer examples can be found than such buildings as the University Club and Tiffany's in New York, and the Boston Public Library, which is French in conception to be sure, but Italian in spirit. The ponderous North German Lloyd, the Late Pullman, and the Early McKinley styles, as well as the Alfalfa Renaissance of the Western Prairies were the precocious *enfants terribles* of those days.

The construction of a cornice, crowning a skyscraper of the vintage of '03, was a veritable *tour de force* of mechanics. Countless tons of terra cotta, limestone, and granite hang suspended, even now, over our city streets. Modillions, weighing many quintals, are anchored to facias, that, in turn, are supported by channels, tees, bolts, nuts, washers, and divers bits of ironmongery, while we walk like Damocles on sidewalks below.

* * *

The Period of the Great Cornice, judging by recent examples, appears to have subsided, and the Period of the Great Door is now in our midst. It was held by some that the cornice should be proportioned to the whole building, like the Strozzi, the Farnese, or the Ricardi, say, but when the building is ten or twenty stories high the strain becomes tense and the mouldings Gargantuan. The Great Cornice is no longer deemed necessary, but by a curious paradox, perhaps to intensify the building's fucatiousness, the Great Door has arrived and is now inflated in proportion to the whole façade, sometimes running up five or six stories with voussoirs of Cyclopean dimensions.

* * *

The influence of Robert Adam (that inspired Scot who gave Spalatro back to the world, the distinguished architect of Reddleston Hall, Derby) is noteworthy in many of our large cities. Luxurious hotels, county courthouses, automobile clubs, and commercial buildings, embellished with cinerary urns, fluted bands, and draped sheeting with flat rosettes at chaste intervals began to appear as the very latest and most correct architectonic expression. Here, again, is the inevitable reaction from the overemphasized and ponderous detail that was supposed to denote strength and lasting power. In this later work, all the projecting mouldings are kept very flat, the reveals delicate, and a half-inch set-back for twenty stories is not unusual to indicate the metonymical division of a bay.

The varieties of the Adam Style are the Wedgwood, used mostly for confectionery shop interiors, and a peculiar arrangement of forms without any mouldings whatever. Large plain surfaces are deployed with contrasting ornament and sculpture in unconventional places. Inserts of contrasting materials are ingeniously displayed; the ornamentation has a haunting, weird beauty, like unto, in a manner of speaking, the work of genii, elfs, salamanders, or hadji, that is two-thirds Greek, one-third Byzantine with a dash of Taj-Mahal bitters skilfully blended to taste; a sort of djinn cocktail, as it were. The revivals of the Romanesque and the Byzantine are more orderly and conventional, possessing a matured beauty and scholarly charm that the earlier work lacked.

* * *

H. H. Richardson possibly was right in selecting these styles with their wealth of naïve detail varying textures, and richness of coloring, to give expression to the complexities of modern life. Our large cities are in essence like that Byzantium, which for centuries was the great trade center of the world, the meeting place for many nations. Perhaps a modified Byzantine art corresponds more closely than any other to our time and customs.

* * *

There has frequently been mention in the professional press of the baleful influence of the Classic and the Renaissance on modern architecture and the part played by the Chicago Exposition of '93. Can it really be as sinister as Mr. Sullivan declares in his autobiographical epic in the September (1923) JOURNAL, that the insidious toxic-poison of the "White Cloud" has gnawed like a canker and withered as if by a blight the tender cotyledons of budding American art? Is the academic mind pallid and affected with virulent snobbishness? Is this even the land of the free, and will "lesions significant of dementia" last until 1943, if not longer? There are many who, while admiring the genius of Louis Sullivan, and welcoming the honesty and sincerity of his contribution to the advancement of the art of architecture, are just as earnestly and conscientiously working in other directions. New forms, new theories, new harmonies lie embedded in the principles and elements of the art of the past. It is for "the hand that serves the brain to break the spell."

The Lincoln Memorial in Washington is a great work

of art, thoughtfully original in spirit and form, comprehending in detail, mass, and plan, a significance that is peculiarly suited and appropriate to its subject. Purity, strength, and breadth of vision are inherent in all its lines. The Freer Museum, in Washington, conceived in different elements, is a dream of loveliness and beauty. It is austere, fresh, virile, and a balm to the soul. The Cunard Building in New York is a masterpiece. It is beautifully planned, dignified, imposing, picturesque. The details and the execution have been worked out with the utmost care and meticulous attention. The Harvard Freshman Dormitories, in Cambridge, form a simple group of buildings than which no college can boast a finer. They are academic, severely plain, built of old brick and painted wood. They are the twentieth century reincarnation of the best period of the eighteenth. The great state of California is fairly pullulating with examples of the very best type of Spanish Colonial, some of them reminiscent of dear old Machinery Hall, Chicago, '93. These recent California buildings seem like a vision in a dream, they are as ethereally beautiful as the demesne of Kubla Khan. Hardly a city in the entire country but what contains examples of architecture that are fine, modern, and progressive, not concerned with "cobweb weaving scholasticism," yet told in terms of academic formulæ.

The same condition confronts us when we examine the modern work that is based on the revival of Monastic forms. If this is the result of the virus of the "White Cloud," then let us be inoculated with this beneficent toxin at suitable intervals.

H. G. R.

Announcements

The pre-publication price of $8.00 for *The Portfolio of Drawings* (bound) by Louis H. Sullivan will be withdrawn on 1 March, 1924, when the price will be advanced to Ten Dollars.

Mr. Stephen Francis Voorhees has been appointed to represent the Institute before the Division of Simplified Practice, Department of Commerce, in the matter of Metal Lath Specifications.

Mr. Sullivan W. Jones has been appointed to represent the Institute on the National Electrical Code Sectional Committee of the American Engineering Standards Committee.

Mr. Alexander B. Trowbridge announces the opening of new offices at 110 East Forty-second Street, New York City, where his practice will be limited to consultation service.

Mr. Gerald Kenneth Goerlings has been awarded the Henry Gillette Woodman Scholarship, University of Pennsylvania, for 1923. The scholarship provides for a year's travel in Europe and is open to the holder of a degree who completes at the University of Pennsylvania the requirements of either of its degrees in architecture (B. Arch. or M. Arch.). Mr. Goerlings received the Bachelor's degree in 1921 and the Master's degree from the Department of Architecture, U. of Pa., in 1922. He was awarded the Brooke Silver Medal in 1921 and the Brooke Gold Medal in 1922 for meritorious work in design, and the Faculty Medal in Architecture in 1921 for the highest standing throughout his Senior year.

New Members Elected

As of 26 December, 1923

Robert B. Crowe, *Montgomery,* ALABAMA; Samuel Lewis Malkind, Joseph A. McCarroll, *Brooklyn,* BROOKLYN; Harvey Storing Horton, *Buffalo,* BUFFALO; R. Bernard Kurzon, *Chicago,* CHICAGO; George Meredith Musick, Ernest Philip Varian, *Denver,* COLORADO; William T. Marchant, *Hartford,* CONNECTICUT; William Harold Butterfield, *Atlanta,* GEORGIA; Ralph E. Scamell, *Topeka;* Paul Weigel, *Manhattan,* KANSAS; Walter T. Vahlberg, *Oklahoma City,* KANSAS CITY; William P. Spratling, *New Orleans,* LOUISIANA; Harold Ward Barker, *Grand Rapids,* MICHIGAN; Ferman Roswell Barratt, *New York City,* NEW YORK; Samuel Grant Alexander, *Asheville,* NORTH CAROLINA; Carl de Moll, Benjamin M. Hall, John Craig Janney, E. William Martin, *Philadelphia,* PHILADELPHIA; John Rodney Tabor, *Houston,* TEXAS.

Obituary

Robert S. Roeschlaub

Elected to the Institute in 1889; to Fellowship in 1900
Died at San Diego, California, 25 October, 1923

Mr. Roeschlaub was born in Munich, Bavaria, 6 July, 1843, his family removing to the United States in 1846. He received his primary education at Quincy, Illinois, and on 19 August, 1862, he enlisted in Company E, Eighty-fourth Regiment of Illinois Volunteers, serving therein until the close of the war. He went through Sherman's famous campaigns and was twice wounded, at Stone River and Chickamauga, and was rewarded for his valor and services by promotion to a captaincy. He returned to Quincy and engaged in the practice of architecture, removing to Denver in 1873, where he continued in practice for forty years until ill-health compelled his removal to California in 1913. In 1875 he was appointed to the East Denver School Board, where he served until 1889, during which time he was continuously in the service of planning and erecting school buildings. He also designed many of the finer residences and business buildings of Denver and was likewise employed on many of the institutions of the State of Colorado.

James Driver

Elected to the Institute in 1913
Died at Boston, Massachusetts, 23 December, 1923

Structural Service Department

LEROY E. KERN, *Technical Secretary*

In connection with the work of the Committee on Structural Service of the American Institute of Architects and in collaboration with other professional societies and organized bodies having the same objective—improvement in building materials and methods and better shelter for humanity in all its manifold vocations and avocations

Abstracts

It is the purpose of the Structural Service Committee and THE JOURNAL *jointly to give, in this division each month, brief abstracts of all publications by the Government Departments and Bureaus, University and other research laboratories, States and Associations, which contain fresh information in regard to materials or methods employed in construction and thus accord architects and others a convenient means of keeping themselves conversant with rapidly expanding knowledge in the technique of construction.*

Concrete Waterproofing (3b4)—(*National Lime Association Bulletin, No. 301. Size 6" x 9". Pages 20. Illustrated*).

Hydrated lime makes concrete watertight by a three-fold action. First, by reducing the probability of visible defects, such as honeycomb, stone-pockets and other weak sections; second, by reducing the size of the smaller voids; third, by acting as a filler in the microscopic voids.

It is a well-known fact that it is common practice to use too much water in concrete mixtures. This is done partly to make the mass more mobile and easier to handle, partly to make it appear thoroughly mixed, though the mixing time has been cut down, and often for no other reason than ignorance of the fundamental principles of good concrete.

The use of an excess of water causes the grout to run away from the aggregates and leave honeycombs, stone-pockets and other weak spots. An excess of water also causes the materials of which the concrete is composed to segregate and settle in strata, topped with a layer of laitance, which has no binding power whatever.

The water that is present in excess of that required for proper consistency and for chemical reaction takes up space. Portland cement requires a comparatively small quantity of water for setting so that all excess must evaporate, and in so doing leaves voids in the mass large enough for water to pass through. Microscopic investigations have demonstrated that a part of the portland cement is converted into laitance and distributed throughout the concrete. Neither porosity or laitance is conducive to the production of strong and watertight concrete. Tests made by the U. S. Bureau of Standards and other prominent laboratories have proven that, within certain limits, the strength of concrete is reduced as the quantity of mixing water is increased. This weakening effect is so marked that within the range of consistencies used in field practice the strength of the concrete may vary several hundred per cent.

Hydrated lime is the most plastic material of construction and for this reason it has been used for years in mortar, plaster and stucco. It is well known how easily it unites with water. After wetting it practically loses its granular character and is converted into a smooth colloidal paste that imparts smoothness and mobility to the concrete to which it is added.

On account of these lubricating properties concrete containing a small percentage of hydrated lime will slide through chutes of less inclination and for a longer distance than concrete without it, fill the forms more perfectly with less spading and surround the reinforcing steel more completely, thus serving as an effective rust preventive. All this occurs at a consistency where the paste or matrix is firm enough to keep both the fine and coarse aggregate in suspension and uniformly distributed throughout the mass, resulting in a more homogeneous, dense concrete with exterior surfaces of better appearance.

Besides eliminating the larger, or visible, structural defects, it reduces the size of the smaller voids through internal lubrication, which permits the particles of the aggregates to easily slide over and past each other, thereby causing them to range in a relative position, which is the most advantageous for maximum density, and finally even these pores of greatly reduced size are filled with finely divided colloidal material.

Thus it is seen that the important rôle of hydrated lime begins the moment it is brought in contact with the other materials and it would appear that its mission is fulfilled when its finely divided particles repose in the minute voids. But this is not the case. The water that is required to convert the hydrated lime powder into paste is held by it mechanically, and this mechanical affinity for water retards the evaporation. After the portland cement has used up, for its early hydration, the water with which it is in direct contact, it draws on the moisture held by the hydrated lime, and this serves to cause further hydration of the cement and the development of the colloid, which factors are of extreme importance for the increase of both strength and watertightness. This must be apparent to all who know how important it is to keep the hardened concrete well supplied with moisture during its early age.

It is a proven fact that, especially with the richer mixtures, the expansion and contraction of the concrete due to moisture changes is many times greater than that caused by temperature changes. This may be the explanation of the appearance of surface disintegration and other defects in concrete, in some cases, several years after it was placed.

The quantity used depends on the nature and size of the aggregates, especially the sand. With coarse, clean sand a slightly larger quantity may be used, while with sand containing a larger amount of fine particles, or even silt or clay, a smaller quantity may be sufficient. Likewise large-sized, hard and sharp crushed stone will require a little more hydrated lime than well-graded gravel.

Years of experience has shown the following proportions to give excellent results in making concrete watertight:

To 1-2-4 concrete add 10 pounds of hydrated lime for each sack of cement used.

To 1-2½-5 concrete add 12 pounds of hydrated lime for each sack of cement used.

To 1-3-6 concrete add 16 pounds of hydrated lime for each sack of cement used.

Since proportioning of concrete in the field is almost always done by volume, it is well to remember that hydrated lime weighs approximately 40 pounds per cubic foot and that an eight-quart pail holds approximately 10 pounds.

While the quantity of hydrated lime used for waterproofing concrete is often expressed as a percentage of the weight of the portland cement (assuming a sack of cement to be 100 pounds) in writing specifications there is less chance of confusion if, instead of expressing it as a percentage, the quantity is stated in pounds of hydrated lime to be added

to the concrete mixture for each sack of portland cement used.

Thermal Conductivity of Concrete (30c3) — (*"The Thermal Conductivity and Diffusivity of Concrete." By A. P. Carman and R. A. Nelson. Bulletin No. 122. Engineering Experiment Station, University of Illinois. Pages 39. Size 6" x 9".*) The object of this investigation was to obtain the absolute thermal conductivity of a number of standard concrete mixtures. Only a few such determinations are recorded in the literature on the subject, and to a large extent these lack definiteness in regard to the composition and method of preparation of the material, so that it is impossible to make more than a very general comparison of the results here recorded with those previously obtained.

Units.—The results of the tests are expressed in terms of the following two units:

The C. G. S. Physical Unit of thermal conductivity corresponds to the flow of one gram-calorie in one second, when the flow is steady, through a section of a plate of the substance in question one square centimeter in area, the thickness of the plate being one centimeter, and the difference between the temperature of the faces of the plate one degree centigrade.

The British Engineering Unit of thermal conductivity corresponds to the flow of one British thermal unit (B. t. u.) in one hour, when the flow is steady, through a section of a plate of the substance in question one square foot in area, the thickness of the plate being one foot, and the difference between the temperatures of the faces of the plate one degree Fahrenheit.

Materials and Proportions Used.—In making the test cylinders "Universal" Portland cement and a dolomitic limestone sand and gravel were used. The aggregate used was mixed in the proportion, by weight, of 55 per cent sand to 45 per cent gravel. The cement and aggregate were mixed in various proportions from one part cement to two parts aggregate, by volume, to one part cement to nine parts aggregate. "Neat" cement cylinders were also tested. Three consistencies were used in the concrete mixtures, the normal consistency and two others with 10 per cent and 20 per cent additional water respectively. The cylinders were thoroughly dry when tested. The normal consistency was such that freshly molded concrete in the form of a cylinder 8 inches in diameter by 12 inches long, with a 1:4 mix, would slump ½ inch to 1 inch when the form was removed. The marble tested was White Alabama, described as a "very good grade" of marble.

General Conclusions.—Neat cement had a much lower thermal conductivity than any of the sand and gravel mixtures.

In the case of the sand and gravel mixtures, there is practically no difference in thermal conductivity due to the relative "richness" or "leanness" in cement of a mixture. The voids in the sand and gravel concrete mixture range from 16 to 20 per cent, while in the case of neat cement the percentage of voids is about 42. It seems probable that the proportion of solid material to voids to a large extent determines the conductivity. The thermal conductivity of a stone, like marble, is much greater than that of a concrete mixture.

As far as consistency is concerned the maximum thermal conductivity occurs with a relative water content of about 110 per cent; for relative water contents of 100 or 120 per cent the thermal conductivity is generally lower.

Age has little if any effect on the thermal conductivity of concrete. If there is any change there is a slight decrease in thermal conductivity with age, but this is small and may be due to very small changes in absolute moisture.

There is very slight, if any, change of conductivity with change of temperature for concrete; for marble, there is a marked decrease in conductivity with rise in temperature.

Dry Kilns (19a32)—*(U. S. Department of Agriculture. Bulletin No. 894. "Manual of Design and Installation of Forest Service Water Spray Dry Kiln." By L. V. Teesdale, Engineer in Forest Products. Pages 47. Size 6" x 9".)* This bulletin contains a description of the water spray kilns, materials and details of construction, heating and water supply, condenser, coils, control instruments and some of the points to be emphasized in specifications.

Principles of Kiln Drying.—The successful kiln drying of refractory wood is absolutely dependent upon the ability of the operator to control and maintain the three essential drying conditions—temperature, humidity, and circulation. Heat is required for evaporation of the moisture; a circulation of air is necessary to carry the heat from the heating coils to the lumber and to carry away the moisture evaporated from the wood; and the relative humidity controls the rate of drying from the surface of the lumber.

Temperature.—There are two definite reasons for accurately controlling the temperature; (1) Many species of wood have very exacting temperature requirements for successful drying, especially while green; and a relatively slight departure from the desired temperature may result in damaged stock. As the drying progresses, however, relatively higher temperatures can be used without causing damage, and usually fluctuations in the temperature at this time may occur without serious damage. (2) Any increase or decrease in temperature not under the control of the operator, or a difference in temperature at opposite ends of the kiln or in different parts of the pile, will affect the relative humidity, and the drying will not be under control.

Humidity.—In the process of drying the surface of a piece of wood becomes drier than the interior, owing to the resistance of the wood substance to the transfusion of moisture. If the drying occurs in hot, dry air the moisture difference between the surface and center portions of a given piece becomes very great. The surface tends to shrink more than the center, with the result that the stresses which develope cause warping and surface checking in the early stages of the run and honey-combing and permanent case-hardening during the final period of drying. To control the drying, therefore, the operator must be able to maintain any humidity desired, independent of the temperature.

Circulation.—Evaporation requires heat. Air is the medium used for conveying this heat to all parts of the lumber pile and for carrying away the evaporated moisture. The circulation must be positive and ample throughout the pile and reasonably uniform in order to produce equal distribution of heat and humidity. A sluggish circulation means slow drying; stagnant air means no drying; and unequal circulation means unequal drying. This is especially significant in the case of green lumber.

Principles of Operation.—In a water spray kiln the air entering the lumber pile is controlled as to the maximum temperature and minimum humidity desired. As the air comes in contact with the moist lumber, it absorbs moisture, which causes a drop in temperature and an increase in humidity. Thus the temperature of the air is somewhat lower and the humidity higher when it leaves the pile than when it enters.

To remove the moisture that has been taken away from the lumber, the air is cooled by passing through the water

sprays. The air leaving the spray chambers is saturated at the dew point of the air entering the pile. During the passage of this saturated air over the heating coils the temperature is raised and the relative humidity thereby is lowered. From the heating coils the air passes to the lumber again at the original temperature and humidity. The cycle is thus repeated.

The temperature of the air as it leaves the spray chamber through the baffles and hence the amount of moisture it carries along is controlled by the temperature of the water admitted through the sprays. The temperature of the spray water itself is controlled by a thermostatic water-mixing valve, which automatically mixes warm and cold water to maintain the desired constant temperature condition; or in certain cases the automatic mixer is made unnecessary because the water may be held at the desired temperature in the well by admitting cold water with the spent water returning from the sprays.

The heating coils are usually controlled by a thermostatic valve placed on the steam supply. The controlling bulb of the thermostat is placed on the entering air side of the lumber pile in which the temperature is to be controlled. The coils are divided into a number of units which are properly valved to be operated separately or together, according to the kind of material to be dried and the temperature required.

Chemical Fire Extinguishers (29e3)—*(Farmers' Bulletin 904. U. S. Dept. of Agriculture. "Fire Prevention and Fire Fighting on the Farm." By H. R. Tolley and A. P. Yerkes. Size 6" x 9". Pages 16.)* The chemical extinguisher in most general use is the soda-acid variety with a capacity of about 2½ gallons of water. An extinguisher of this kind consists of a closed metal tank strong enough to withstand considerable pressure and partly filled with a solution of bicarbonate of soda (baking soda). In the top of the tank is a bottle of sulphuric acid, which is closed by a loose-fitting lead stopper. The only outlet to the tank is a rubber hose equipped with a nozzle. To operate the extinguisher the tank is simply turned bottom upward. This permits the sulphuric acid to escape gradually around the stopper, which drops out against the top of the tank. The acid comes in contact with the soda solution; carbonic-acid gas, which produces great pressure, is generated, and the water and gas are forced out through the hose and nozzle. Both the water and the gas, which is noncombustible, assist in extinguishing the fire. The chemical extinguishers which are approved by insurance companies are tested to withstand a pressure of 350 pounds. They are designed to hold 2½ gallons of water mixed with 1½ pounds of bicarbonate of soda, and the bottle holds 4 ounces of acid. The stream which is thrown at the blaze has a range of from 25 to 40 feet and will flow for about one minute. These extinguishers can be refilled and used many times. When not in use they require no attention, except that they should be discharged and thoroughly cleaned and refilled once a year, and must be protected from freezing. These extinguishers are useful on any fire which water will quench, but are not very effective in gasoline or kerosene fires.

Another type of chemical extinguisher consists of a quart of fluid in a double-action metal syringe, the handle of which is worked back and forth to eject the liquid. The chemical agent which smothers the fire is carbon tetrachloride. This is a liquid which does not freeze until a temperature of 50 degrees F. below zero is reached. When the temperature rises to about 200 degrees F., very nearly the temperature required to boil water, it turns into a heavy vapor, which covers and smothers the fire. It is especially useful in extinguishing fires on which water or carbonic-acid-gas extinguishers have little effect. Burning oil, gasoline, kerosene, or acetylene generally can be subdued with it and it is especially valuable in the garage. It is not poisonous and evaporates quickly without damaging articles on which it is thrown. However, a large quantity of the vapor may cause suffocation of persons remaining in a closed room with it. Caution in its use is therefore necessary.

Dry Powder Extinguishers.—There are on the market many makes of extinguishers consisting of sheet-metal tubes filled with powder, which decomposes when thrown on a hot fire and produces a noncombustible gas which smothers the flames by shutting off the oxygen. The manufacturers recommend them for fires in confined spaces, and especially for chimney fires, and in many cases they have been effective in curbing gasoline and oil fires. The ingredients are coarsely powdered, decompose easily without explosion, and give off a strong odor and much smoke. They appeal to many on account of their low cost when compared with other extinguishers, but their value has been greatly exaggerated and most experts in fire protection do not recommend them. Their use in attempts to extinguish fires on which they can be of little help is likely to cause disastrous delay in the use of water or other approved agents.

"Hand Grenade" Extinguishers.—Glass bottles of spherical form containing fire-extinguishing liquids of various kinds are sold in many places. The bottle is to be thrown on the fire and broken and the liquid thus liberated. When heated the liquid gives off a noncombustible gas, and in some cases is supposed to encrust the burning material with a fireproof chemical and thus smother the fire. These grenades are not as dependable as other forms of extinguishers. Their capacity is small, it is difficult to throw one of them to the base of the fire, and sometimes they do not break when thrown. As in the case of the tubes of dry powder, they are likely to cause serious delay in the use of better extinguishing agents.

Plating Solutions (15e)—*(Zinc Cyanide Plating Solutions. Technologic Paper of the Bureau of Standards No. 195. Pages 19. Size 7" x 10".)* During the war there was a great demand for information upon zinc plating or "electro galvanizing," as it had been shown that zinc coatings furnish by far the best protection against the corrosion of steel. Two types of zinc plating solutions have been used commercially, namely, the sulphate and cyanide solutions. Comparative experiments have shown that satisfactory deposits can be obtained from both sulphate and cyanide solutions, but that the latter possesses the properties of "throwing" the deposit better upon irregular-shaped articles. The paper contains a highly technical description of the general principles, the preparation of solutions, analysis of solutions, and operation of solutions.

Hog Houses for Nebraska (351)—*(University of Nebraska, Agricultural Experiment Station. Circular No. 14, by O. W. Sjogren and I. D. Wood. Pages 20. Size 6" x 9". Illustrated.)*

The material contained in this bulletin is a culmination of several years' study and investigation of the different types of hog houses used in Nebraska. It is realized that the plans given will not suit all conditions that may arise, but an effort has been made to bring out the essential factors so that the plans may serve as a guide in planning a house suited to particular conditions.

Synopsis. The essentials of an ideal hog house; the location of the hog house; foundations; floors; partitions and

fastenings; guard rail; outside doors; roof windows; heating of hog houses; individual house versus colony house; North and South colony house—hog house 10.72-14; North and South colony house—hog house 10.72-51; bill of material for North and South colony house; South facing colony house—hog house No. 10.72-53; bill of material for South facing colony house; large colony house for pure-bred breeder—hog house No. 10.72-50; individual hog house—No. 10.72-49; bill of material for individual house.

Hog Houses (351)—*U. S. Dept. of Agriculture, Farmer's Bulletin 438, by J. A. Warren. Size 6" x 9". Pages 24. Illustrated.)*

Synopsis. Need of shelter for hogs; cost of housing pigs; varieties of hog houses; examples of faulty construction; two well-built hog houses; a combination hog house with hay and grain storage rooms; two types of cheap houses; hog cots or individual houses; hints on construction; where to place windows; sunshine tables.

Feed, Amount Used by Farm Animals (351)—(*An economic study of dairying on farms in Broome Co., N. Y. Bulletin 409, Cornell University Agric. Exp. Sta.)*

POUND FEED USED PER COW PER DAY

	Pasture period	Winter period
Grain	.856	6.007
Silage	.471	18.110
Other succulent feed	3.359	1.471
Dry forage	.084	20.141

The Farm Layout, How to Plan (38)—(*New York State College of Agriculture, Cornell University. Extension Bulletin 55, by W. I. Myers. Pages 34. Size 6" x 9". Illustrated.)*

This bulletin indicates the importance of and the factors to be considered in rearranging farm layouts to permit efficient use of labor saving machinery.

Synopsis. Why many New York farms need rearranging; important factors in planning a good farm layout; actual rearrangements made by owners of some New York farms; how to plan a farm rearrangement.

Lime Stucco (21d3)—(*Continued from the January issue.*)

The details of general construction include the following essential points of good stucco design: Overhangs, cornices and the like detail to prevent any water from reaching the top or getting back of the stucco.

Parapet walls should have wide copings and water-tight joints, and, under the copings, irrespective of their materials, place metal flashings to form a drip.

The tops of chimneys should be treated with a projecting course with drip, and, if jointed, flashed as mentioned for copings. The connection with the roof or building should be flashed.

Flash over all door and window openings, wherever projecting wood moldings occur.

Continuous sills should have large overhangs with drips cut on the under side; or, if of brick or otherwise jointed, flashed similar to copings. All sills should have stools, and lugs, or seats to receive the stucco jambs, or if of wood should have metal stops on the end or be cut out at the back to be entirely clear of the stucco face.

Stop all stucco not less than two to three inches above any roofs, promenades, or decks and terminate upon flashed wood strips or upon other projecting bases.

Avoid whenever possible stuccoed copings, cornices and other exposed horizontal surfaces. Any horizontal courses, bands, or other projections should be flashed on the tops, or washes, and should never slope less than one inch in two inches.

Place fasteners for rainwater conductors, supports for gutters, and other permanent fixtures previous to the application of the stucco.

Terminate stucco upon a base of stone, brick, or other suitable masonry, eighteen inches above grade as a minimum distance, to prevent discoloration from splashing rain as well as to minimize the effects of dampness from capillarity. A continuous damp-coursing of slate or of bituminous materials is recommended in masonry walls just below the starting line of any stucco, close to grade.

Walls of brick, hollow building tile, or concrete should be clean and present a good mechanical key or suction bond for the scratch coat. Possible settlement of walls should be thoroughly investigated and prevented as far as possible. Lintels or arches should be of the same material as the backing wherever practicable, and any which are of wood or metal should be thoroughly metal lathed with the lath extended well onto the backing.

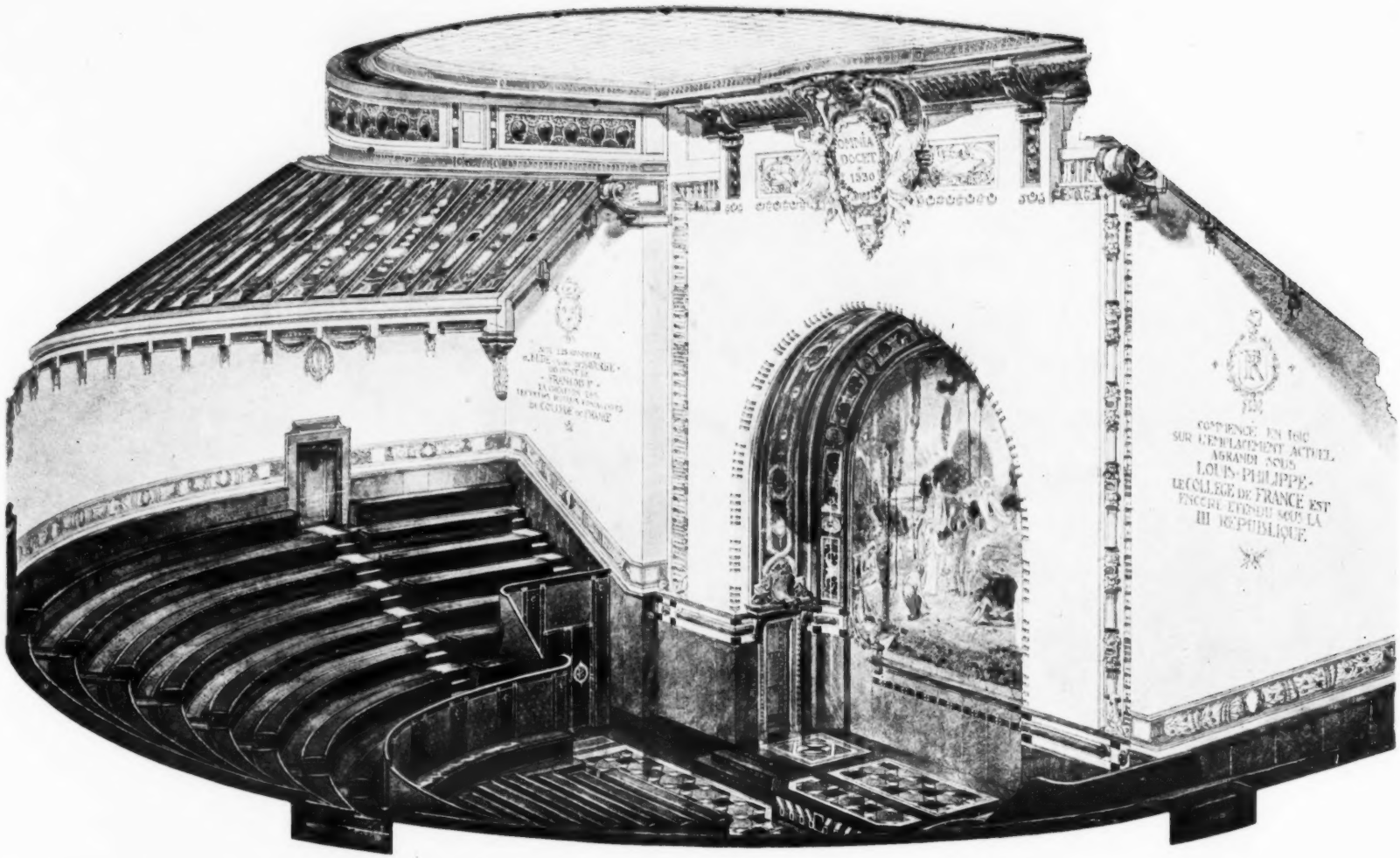
Lathing fastened to masonry or to the skeleton construction of a structure to form the key for the stucco may be either of wood or metal and must be firmly secured in order to withstand the necessary pressure for applying the stucco.

The recommendations of the American Concrete Institute state: "Waterproofing materials of any type should not be necessary in properly mixed and applied cement stucco. Stucco will absorb water to some extent in rainy weather, but this is not injurious."

The opinions of those who have had wide experience with lime stucco indicate that the above statement holds equally true for lime stucco.

"Water-marking," or the outlining of structural units by dark lines due to moisture retained after a rain, is largely due to difference in absorptive powers of the backing. If the backing is composed of units of nearly the same absorptive power, this difficulty will not be encountered. Any backing should be thoroughly wet, before stucco is applied. This will tend to bring all units of the backing to the same degree of dampness, and when the stucco is applied conditions will be more constant.

Synopsis.—Historical Resume, Modern Lime Stucco, Interesting Examples of Modern Stucco Work, Basic Specification for Lime Stucco, Notes on Basic Specification, on Overcoating, Quantities, Weights, and Measures.



Proposed Enlargement of the Collége du France
The Amphitheatre; A. Guilbert, *Architect*